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the Breakdown of Milk Protein

by Benger's Food

Milk, as soon as it comes in contact with the gastric juice, forms heavy curds. Many children and adults cannot properly digest these curds, and they cause pain and discomfort to persons with impaired digestion. For this reason many who most need milk are denied its great benefits.

As soon as hot milk is poured on to Benger's Food the active pancreatic enzymes, held dormant in its wheaten base become active. Within a very short period — less time than it takes the milk and Food to become cool enough to drink — the milk protein is modified so that only very finely divided curds can form upon contact with the gastric juice. At the same time the starch in the wheaten base of Benger's Food has been rendered soluble with the formation of dextrins, dextri-maltoses and maltose. By virtue of these active digestive enzymes Benger's Food, prepared with fresh milk, forms in the stomach finely divided flocculi, which present a huge surface area for digestion.

Sole Manufacturers: BENGER'S FOOD, Ltd., Holmes Chapel, Cheshire, Eng.

The Benger Laboratories are always at the disposal of the medical profession in any of their dietetic problems.

8 T.6

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● FOR THE RAPID CONTROL OF HÆMORRHAGE

T.C.M. Dressings provide a new method of effectively and speedily controlling hæmorrhage.

The Dressings are treated with Thrombin-Coagulant-Maw—a stable preparation of Thrombin, the natural clotting agent of blood—which anticipates the formation of Thrombin in normal shed blood so that clotting commences in a few seconds.

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WAR-TIME hospital practice throws even greater emphasis on the need for a form of concentrated nourishment—a perfect invalid food. Practically all patients on admittance are acutely ill and have undergone a period of high nervous tension. Experience has shown that administration of an easily digested and readily acceptable form of nourishment is followed by definite improvement in the patient's condition.

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"Ovaltine" possesses many advantages over ordinary food drinks. It is a concentrate derived from malted barley, full-cream milk and eggs from the world-famous "Ovaltine" farms, and contains vitamins A, B complex and D, and important mineral elements. Its content of "first class" protein, carbohydrate and fat is carefully adjusted to the optimal ratio for metabolic needs. Moreover, "Ovaltine" possesses special properties which make milk more digestible, and thus easily assimilated by even the most acutely ill patient.

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BRAND OF CHLOROPHYLL TABLETS

For the treatment of
Hardening Arteries, Abnormal Blood Pressure
Cardiac Weakness, Physical Decline
Debility, Neurasthenia, Anaemia

"'Phyllosan' has been before the profession now for fifteen years and has stood the test of time, and the developments indicated point to still greater usefulness for this product in the future."

Vide THE PRESCRIBER, Jan., 1938

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Sodium Pentose Nucleotides

For the treatment of Agranulocytosis

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Pentose nucleotides, intravenously and intramuscularly, in adequate dosage, have proved successful in agranulocytosis. For the treatment of this condition and other disorders in which increased production of polymorphonuclear leucocytes is desirable, Allen & Hanburys Ltd. have prepared a solution of Sodium Pentose Nucleotides which they issue under the name "Pentide," in vials of 10 c.cm. at 5/-.

Particulars and literature on application

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Raw Liver contains the active principles applicable respectively to the treatment of
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PERNICIOUS ANAEMIA
SECONDARY ANAEMIAS HAEMORRHAGIC ANAEMIAS
NUTRITIONAL ANAEMIAS

SUPPLIED IN BOTTLES, 3/11 and 6/6

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WHAT IT CONTAINS.

Contains in solution, in an agreeable form, the entire nutritive constituents of beef and wheat.

Contains all that is digestible in beef—in its juice and in its muscle tissues.

Contains all that is digestible in wheat—its gluten, its carbohydrates.

Contains all the savory and stimulating elements, the extractives, the mineral constituents of beef and wheat.

Contains these constituents in the soluble, perfectly diffusible form into which they are converted in the process of normal digestion.

USES OF 'PANOPEPTON.'

Can be relied upon in cases where the nutrition of the patient is of prime importance.

Has saved the patient in desperate straits due to intolerance of food.

Has nourished and restored in cases of intolerance of other foods.

Possesses remarkably restorative and stimulating properties.

Is most nutritious, most agreeable as a food at night against insomnia-exhaustion due to acute need of nourishment.

SUPPLIED IN 12-oz. BOTTLES.

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—vide B.M.J., 1937, i, 595

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By reason of its detoxicating and consolidating properties Kaylene is invaluable in the treatment of tropical diarrhoea, acute colitis and gastro-enteritis. Kaylene has an adsorptive and analgesic action. KAYLENE-OL should be given if, after the diarrhoea has been overcome, a mild laxative action is desired.

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CHLOROPHYLL TABLETS

(a chlorophyll-beta carotene combination)

EYE STRAIN from the " black-out," and night-blindness

NERVOUS STRAIN from abnormal living conditions

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ARE SOLUBLE

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The safest analeptic for use in emergencies. Large doses produce no undesirable effects.

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Omn/E/409

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The winter's epidemics gave ample proof that national well-being (and indirectly, national morale) must be supported by every iota of our nutritional knowledge. In this task of nourishing and protecting the nation, Farex can play a valuable part because it embodies in a single digestible food, protective vitamins and minerals which otherwise could only be secured in an expertly chosen and varied diet. Farex is composed of wheat-flour, wheat-germ, oatmeal and maize, with *added* minerals and vitamins A, B and D. As befits a 'staple food,' Farex provides an abundance of carbohydrate; but the high percentage of protein (15%) and the presence of iron, calcium and phosphorus, and vitamins A, B and D, lift it right away from the usual run of 'health cereals.' As a weaning and invalid food Farex has been used successfully for years. But now, when national good health is a national armament, it cannot be too strongly emphasised that Farex is equally valuable as a daily nutritional safeguard to stand behind *all* diets, for all ages and conditions of people. Farex is ready-cooked, prepared in a few moments, and can be flavoured to personal taste. In emergency, Farex alone will maintain the nutrition of the individual longer than any other single food available.

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Encouraging regular Habit Time

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'Petrolagar'

BRAND PARAFFIN EMULSION

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ANALGETIC ANTIPYRETIC

Water-soluble Calcium Acetylsalicylate

—a notable advance in the production of antipyretics, effective in most stubborn cases.

Issued in tablets each in gr. 8 (and in powder). Trial samples gladly sent on request.

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WATER SOLUBLE :	NEUTRAL SALT	CALCIUM SALT
Therefore easily absorbed and can be administered in solution.	(non-acid) : therefore no disagreeable by-effects even on sensitive stomachs.	Therefore develops antiphlogistic and sedative effects.

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SOLUTION TABLETS

Buffered Proflavine Sulphate Isotonic

FOR THE PREVENTION AND CONTROL OF WOUND INFECTION

A BOOTS PRODUCT

Isoflav Solution Tablets of Proflavine Sulphate are so prepared that one tablet dissolved in 4 fl. oz. of distilled water makes a 1:1000 isotonic buffered solution at approximately pH 6.3.

★ *Extract from "Proceedings of the Royal Society of Medicine," 1940, June, page 487. (Discussion on the effect of antiseptics on wounds):*

"We therefore feel that in recommending proflavine sulphate (0.1% in isotonic saline buffered to pH 6.2) for application to wounds of the brain we are supporting an antiseptic which is both potent against bacteria and yet innocuous to the tissues."

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Rstm/E/422

ALASIL

Better Salicylate Therapy

WHATEVER be the season of the year, there is a wide sphere of utility for "Alasil," the improved form of salicylate medication. "Alasil" is a very definite advance on ordinary compounds of salicylic or acetyl-salicylic acid both in therapeutic efficiency and in freedom from unpleasant gastro-intestinal sequelæ. This high tolerability is due to the fact that "Alasil" is composed of calcium acetyl-salicylate—the least irritating of the salicylate compounds—and "Alocol" (Colloidal Hydroxide of Aluminium), a powerful gastric sedative and antacid.

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M269

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Brand TABLETS
A TRUE CHOLAGOGUE

"Bile salts are the only certain cholagogues"

vide *Lancet*, i/1925, 1207

In cholecystitis, cholelithiasis and other functional disorders of the liver and gall-bladder, Veracolate serves as a reliable cholagogue in the treatment as well as in the prevention of these conditions.

Veracolate not only supplies combined bile salts, sodium glycocholate and taurocholate, but also provides for the relief of intestinal stasis generally present in gall-bladder disease.

Veracolate Tablets are supplied in bottles of 50, 100 and 500.

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ANAHÆMIN B.D.H.

for

Economy of Treatment in Pernicious Anæmia

The following report of a typical case of pernicious anæmia, following the use of Anahæmin in the routine clinical testing of this product, demonstrates its marked effect produced by only 1 c.c.

Initial counts : R.B.C. 1.76 millions, Hæmoglobin 42%, Colour Index 1.19, Reticulocytes 2.8%
Treatment : Injection 1 c.c. Anahæmin
5th day counts : R.B.C. 2.49 millions, Hæmoglobin 51%, Colour Index 1.03, Reticulocytes 17.4%
10th day counts : R.B.C. 2.64 millions, Hæmoglobin 60%, Colour Index 1.12, Reticulocytes 2.2%
15th day counts : R.B.C. 3.18 millions, Hæmoglobin 69%, Colour Index 1.08
The reticulocyte peak of 18% was reached on the 6th day.

The injection of only 1 c.c. of Anahæmin acting over a period of 15 days raised the red cell count from 1.76 to 3.18 millions, and the hæmoglobin percentage from 42 to 69.

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An/E/66b

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safe, gentle, and palatable.

LIXEN is an extract of senna prepared by a special cold process to allay the griping action. The absence of an after-constipating effect gives it a special value in habitual constipation, and its gentle, though efficient, action, together with its pleasant flavour, makes it particularly acceptable to women, children, elderly and delicate persons, and convalescents, for whom the finding of a satisfactory aperient is often difficult.

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In bottles of 2 oz. 1/2, 4 oz. 2/-, 8 oz. 3/6, 16 oz. 6/6.
In bottles of 40 and 80 oz. for dispensing.

LIXEN LAXATIVE LOZENGES
In tins of 12, 8½d., 24. 1/2 and bottles of 100, 4/-.
In bottles of 500 for dispensing.

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" The nutritional needs in pregnancy are those necessary to the continued efficiency of the function of nutrition throughout life. For in this efficiency, the efficiency of that other fundamental function of the body—reproduction—is inherent "—*" B.M.J. " 7.8.37.*

It is generally acknowledged that in pregnancy and lactation, a sufficiency of calcium, iron, phosphorus and vitamins, must be available to prevent complications and disorders. These are the elements which are constantly being drained. In Prenatalac the Doctor and Nurse have a natural milk food rich in minerals and vitamins, in a base of rich Full Cream Milk Solids. Prenatalac is used regularly in Hospitals and Institutions and is also packed conveniently for private practice.

ANALYSIS

	Dry Food	Reconstituted Food (1 in 8)
	%	%
Fat	27.10	3.4
Proteins	26.50	3.3
Lactose	37.45	4.7
Milk Salts	5.85	0.7
Iron Salts	0.90	0.1
Moisture	2.20	87.8
	100.0	100.0
Calorific value per oz.	146.0	18.3
International Vitamin D Units per pint		250

Prenatalac

a Milk Diet for Ante-Natal Purposes

COUPON To COW & GATE LTD., Guildford, Surrey.
Please send me, post free, literature and clinical samples of Prenatalac.

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A COW & GATE PRODUCT

Canadian Doctors are invited to write to COW & GATE (CANADA) LTD., GANANOQUE, ONTARIO, CANADA, for samples and any further information.

TRADE MARK **'ENTORAL'** BRAND

Oral Cold Vaccine

● 'Entoral' has been subjected to careful clinical investigation among industrial and institutional groups, office workers, and school children. Increase of species-specific and species-broad (heterophile) immunity to the secondary pathogens of the upper respiratory tract by its use has decreased at least 60 percent the incidence of colds in the vaccinated units and has controlled the severity, duration, and disability of infections in persons not completely protected.

Vaccination with 'Entoral' involves the administration of a single capsule of the vaccine daily for one week, followed by one capsule twice a week throughout the period when upper respiratory infections are prevalent. Immunization should be repeated annually.

'Entoral' brand oral cold vaccine is supplied in bottles of 20 and 60 'Pulvules' brand filled capsules.

ELI LILLY AND COMPANY LIMITED
BASINGSTOKE AND LONDON

COMMON COLDS AND INFLUENZA

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RESPIRATORY MIXED VACCINE

For Oral Administration

For the prophylactic immunization against bacterial infections of the respiratory tract

'VACAGEN' RESPIRATORY MIXED VACCINE tablets are prepared with soluble antigenic substances which are released upon reaching the intestines and are rapidly absorbed, thus promoting the formation of antibodies which help in combating the infection.

Supplied in vials containing 20 enteric-coated tablets

FORMULA: *Each tablet contains the soluble antigenic fraction of :—*

25,000 MILLION PNEUMOCOCCUS* (DIPLOCOCCUS INFLUENZAE)
15,000 MILLION STREPTOCOCCUS**
5,000 MILLION INFLUENZA BACILLUS (HEMOPHILUS INFLUENZAE)
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* *Types I, II & III* ** *Hemolytic, non-Hemolytic & Viridans*

Literature supplied on request

SHARP & DOHME LTD

Mulford Biological Laboratories

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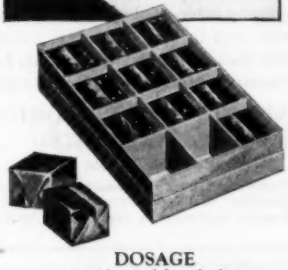
A Mild Savoury Sedative—



APPETISING & *Non*-HABIT-FORMING

Crookes' Sedative Bouillon provides an appetising soporific, of especial value in these anxious times, in which the drugs sodium bromide and chloral hydrate are completely masked in the guise of seasoning added to a savoury vegetable consommé. This is prepared by dissolving one or two cubes (as may be prescribed) in a cupful of hot water, and adding salt and pepper to taste. The well-known physiological changes in the stomach which greet an appetising hot drink lead to more complete and rapid absorption than when a draught is administered, thus enhancing the therapeutic effects.

Crookes' Sedative Bouillon is suitable for both adults and children. It may safely be taken by patients undergoing treatment with sulphanilamides, and as it does not contain meat extractives pressor tendencies are not aggravated.

DOSAGE
(stated on each box of cubes)
Adults 1 to 2 cubes : Children ½ to 1 cube dissolved in hot (not boiling) water half-an-hour before retiring.
Box of 12 cubes - - - - 2/6

Crookes'
Sedative Bouillon

THE CROOKES LABORATORIES (*British Colloids Ltd.*) **PARK ROYAL, N.W.10**
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T.G.S

After Spinario: Boy Runner Extracting Thorn from His Foot; Museo Capitolino, Rome.

250 TO 1,500 TIMES MORE GERMICIDAL THAN PHENOL

depending upon the organism used in the test

Amongst the numerous advantages of Metaphen (Abbott), the powerful antiseptic properties of the drug are, of course, the most important. In tests made under properly controlled conditions Metaphen has been shown to have a phenol coefficient of 250 to 1,500, depending upon the organism tested. ● Metaphen is relatively non-toxic to human tissue; is not painful on application; does not cause irritation or dermatitis; and does not precipitate in the presence of serum. Solutions of the drug are stable when exposed to air. ● Metaphen is recommended in infections of the genito-urinary tract, eye, ear, nose, throat and skin. It is of value as a general antiseptic in surgery, and for the disinfection of equipment. ● Metaphen is supplied through pharmacies in a variety of useful forms, the most widely employed of which are: TINCTURE METAPHEN, a tinted, alcohol-acetone-aqueous solution prepared especially for use as a pre-operative skin disinfectant and for all other uses for which a powerful but safe antiseptic tincture is indicated. ● METAPHEN SOLUTION 1:500, an aqueous solution which is recommended for general use in surgery, urology, obstetrics, gynæcology, and in eye, ear, nose, mouth and throat practice. ● Requests for descriptive literature are welcomed.

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(BRAND OF 4-NITRO-ANHYDRO-HYDROXY MERCURI-ORTHO CRESOL)

PLEASE SEND LITERATURE ON METAPHEN TO

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Lancet-12

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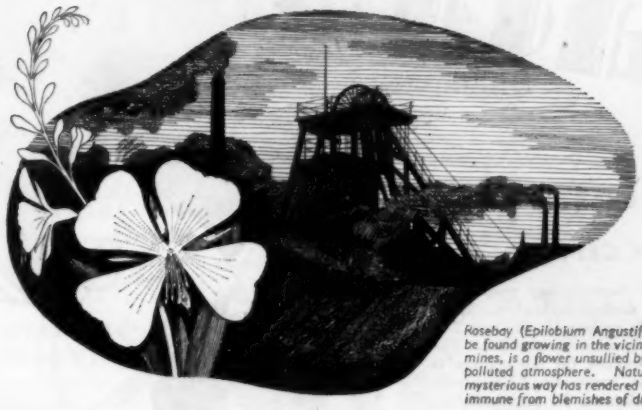

Rosebay (Epilobium Angustifolium), to be found growing in the vicinity of coal mines, is a flower unsullied by the dust-polluted atmosphere. Nature in her mysterious way has rendered this flower immune from blemishes of dust.

Immunity from Colds

The changed environment caused by evacuation.
The arduous duties of Civilian Defence.
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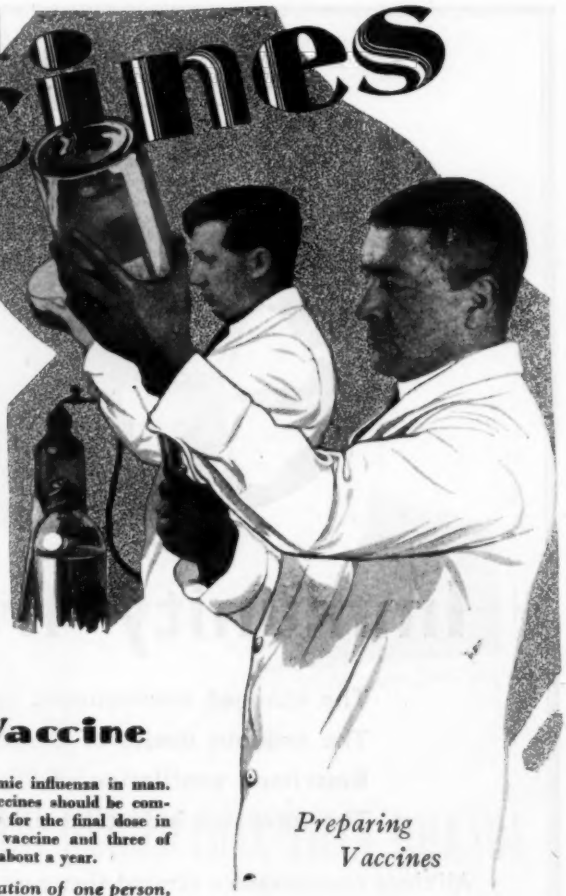

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ORIGINAL ARTICLES

GLOSSITIS AND VITAMIN-B_2 COMPLEX IN PELLAGRA, SPRUE, AND ALLIED STATES

BY P. MANSON-BAHR, C.M.G., D.S.O., M.D. Camb., F.R.C.P.

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(With Coloured Illustrations on Plate)

THE aphorism "raw red tongue, raw red gut" may contain more than a grain of truth; the tongue may be regarded as a mirror of the stomach and intestines. Sprue tongue is well known, and a similar condition is seen in pellagra, pernicious anæmia and idiopathic steatorrhœa, which are characterised by anæmia and intestinal upset.

The known ætiological factors in this group of diseases include nicotinic acid and riboflavin.

Nicotinic acid.—Pellagra was experimentally produced in man by Goldberger in 1926; subsequently black-tongue in dogs was recognised as analogous to pellagra, as were comparable diseases in monkeys (Harris 1937, 1939), and in pigs (Birch, Chick, and Martin 1937). Birch, Györgyi, and Harris (1935) described the pellagra-preventive (P.P.) factor as a third component of the vitamin-B_2 complex, differing from the rat-pellagra factor and from riboflavin, and this was soon found to be identical with nicotinic acid. Spies, Bean, and Ashe (1939) who controlled their observations on the treatment of pellagra by gastroscopy and examination of the tongue and mouth, noted that the condition of the gastric mucosa resembled that of the mouth. The administration of adequate amounts of nicotinic acid was followed within two or three days by the disappearance of many signs, including the fiery redness and swelling of the tongue, gums, and vagina. The requisite dose was varied, but 500 mg. daily in divided doses was usually effective. It now appears that nicotinic acid is necessary for the normal action of the stomach and intestines, the skin, and the nervous system. Further, Elvehjem et al. (1937) have demonstrated that the activity of liver in the treatment of blacktongue in dogs is due to its content of nicotinic acid.

Riboflavin.—The identity of vitamin-B_2 complex with the yellow pigment in Warburg's enzyme was established by Kuhn et al. (1933); later it was isolated by Karrer from milk, eggs, and liver, and it is a water-soluble pigment widely distributed among plants and animals. The human requirements are estimated at 2–3 mg. daily, and it has been found to be necessary for growth and cell respiration. The part it may play in pellagra is shown by the fact that a deficiency of riboflavin may lead to cheilosis (angular stomatitis), which has been experimentally produced in man by Sebrell and Butler (1937, 1938, 1939).

Other factors.—That this subject is complex is shown by the fact that the extrinsic factor of Strauss and Castle (1932), which is a component of the P.A. factor in sprue and pernicious anæmia, has a distribution and a stability to heat resembling those of the vitamin-B_2 complex; but it is distinct from riboflavin, vitamin-B_6 (adermin), and the P.P. factor (Birch, Györgyi, and Harris 1935). The extrinsic factor is present in yeast preparations which are efficient in the megalocytic hyperchromic anæmias of sprue and idiopathic steatorrhœa, but ineffective in pernicious anæmia, and it has been suggested that anæmias reacting to yeast preparations are due to lack of this particular factor.

GLOSSITIS AND STOMATITIS OF FULLY DEVELOPED PELLAGRA

Stannus (1911–12), describing pellagra as seen in Nyasaland, drew attention to glossitis and excoriation at the angles of the mouth in native prisoners, several of whom later developed cutaneous eruption on various parts of the body. A deficient dietary was held responsible.

Enright (1920) watched the development of pellagra ab initio in 65 German and Austrian prisoners of war in Egypt, all of whom had had chronic diarrhœa or dysentery. The lips were cracked, especially at the angles of the mouth, at the onset of the illness. When the dermatitis had fully developed, the epithelium of the tongue exfoliated, leaving smooth and shiny the tip and edges, in which the fungiform papillæ stood out prominently (fig. 1).

Spies and Cooper (1937) have paid especial attention to the tongue and mouth in pellagra and have published coloured illustrations of the raw beef-steak appearance and angular stomatitis, with indentations caused by the teeth at the tip and sides of the tongue. This was noted in the typical disease of dietary origin as well as in secondary pellagra associated with tuberculosis of the intestinal tract and other disorders interfering with ingestion or assimilation of the P.P. factor in food. The glossitis and stomatitis are specially marked in alcoholic pellagra, and dysphagia is often noted. Spies, Bean, and Stone (1938) have reported that the effects of nicotinic acid, nicotinic-acid amide, and sodium nicotinate on the stomatitis of primary and secondary pellagra are striking. This treatment blanches the erythematous dermal lesions, heals the glossitis, vaginitis, urethritis, and proctitis, and reduces the amount of porphyrin in the urine. It can therefore be concluded that acute glossitis and angular stomatitis (cheilosis) are the primary and almost invariable concomitants of pellagra and are especially amenable to treatment with the vitamin-B_2 complex.

GLOSSITIS AND STOMATITIS OF LARVAL PELLAGRA

Harris (1939) has suggested that most pellagrins never develop all the classical symptoms of this disease, and Fakhry (1932) has drawn attention to the frequency of stomatitis without the other symptoms in the pellagra season in Egypt. Stannus (1936) has called this incomplete stage "pellagra fruste," and Biggam and Ghalioungui (1933) refer to it as "larval pellagra." As originally recorded by the older pellagrologists (Zanetti 1778, Strambio 1789) the glossitis of pellagra may antedate the dermatitis by months or years.

I have described (Bahr 1915) an endemic sore-tongue disease in Ceylon which from its resemblance to sprue tongue was at first considered to be in some way connected with this disease. This sore-tongue disease was also found in burghers, or descendants of original Dutch settlers, and was prevalent among the indigenous prisoners in the public jails, more especially those serving long sentences.

The appearance of these tongues varied widely according to the stage of the disease. In the most advanced the stripping of the epithelium was complete and left a raw, glazed, and superficially fissured tongue. This was combined with a diseased buccal mucosa and cracked leucoplakic angles of the mouth (angular stomatitis). It was well known to the prison officials and was ascribed to the eating of salt fish. The ingestion of half-cooked liver or of liver soup was regarded as a valuable remedy. Although there was no associated dermatitis, a possible relationship to pellagra was suggested; but later Nicholls (1935) referred to this condition as definitely pellagrous.

In Tunis Jamin (1925) has described as *stomatite d'automne* a desquamatory glossitis with similar changes in the lips and soft palate; Nogue (1925) has noted an epidemic form in Dakar, Senegal; and Katzenellenbogen (1928) a similar condition in Palestine. Blacklock (1925) and Wright (1928) in Sierra Leone, Bradley (1929) in the Seychelles, Fitzgerald (1932) in Assam, Landor and Pallister (1935) in Malaya, and Moore (1934) in Nigeria have noted similar outbreaks of glossitis. The impression is obtained from a study of these papers that these various observers from the tropics are all describing the same pathological appearances of the mouth and tongue in ill-nourished people living on a diet deficient in proteins.

Manson-Bahr and Ransford (1938) showed that a form of glossitis and stomatitis encountered in England was curable with nicotinic acid, and Katzenellenbogen (1939) in Palestine recognised the connexion between the vitamin-B_2 complex and glossitis and effected a rapid cure with relatively small doses—i.e., 50 mg. given four to six

times daily. The influence of sunlight in producing the dermatitis of pellagra in these larval cases is discussed by Bickel (1938), Villaret et al. (1939), and Kielland (1939). Larval pellagra may be recognised in English practice in patients who complain of glossitis (fig. II) as in the following cases seen during the last two years, in which there was a long history of gastro-intestinal disturbance associated with a diet deficient in proteins. Besides the glossitis there was usually roughening of the skin covering the elbows and knees.

CASE 1.—A young married woman, aged 26, resident in Surrey, had had glossitis, loss of taste, aphthous ulceration, salivation, and cheilosis for six years. She had also had colitis and had dieted herself accordingly. Loss of weight 20 lb. The skin was rough and dry, especially on the elbows and knees. Treatment with nicotinic acid 150 mg. daily for fourteen days produced rapid improvement in the condition of the tongue, and in the colitis and the return of the sense of taste. Cheilosis (angular stomatitis) subsequently healed by treatment with riboflavin 3 mg. daily for a week.

CASE 2.—A man, aged 50, had suffered from glossitis and cheilosis for two years, with loss of taste-sense and salivation. At 25 he had had "dilated stomach" and subsequently "colitis" and recurrent bouts of anæmia. Prolonged meatless dietary on medical advice. Response to nicotinic acid 150 mg. given daily for fourteen days was striking.

Three other cases of stomatitis with cheilosis were seen in women aged 32, 62, and 70. Two of them had resided in South Africa and had had diarrhœa and "colitis"—a combination which in one instance had led to a tentative diagnosis of sprue. All had been taking a diet deficient in proteins. The response to nicotinic acid was immediate, and it was found that this had to be maintained in doses of 150 mg. daily given in courses of fourteen days with intervals of a similar period over a period of three months.*

GLOSSITIS AND STOMATITIS OF TROPICAL SPRUE

Of the authorities who have written on sprue Manson in particular emphasised the peculiar nature of the distinctive lingual and buccal lesions, which he considered and specific.

The initial lesion is a diffuse inflammation involving the fungiform papillæ, which are swollen and prominent. These lesions vary in intensity from day to day. The characteristic aphthous ulcers appear often at the centre of the inflamed area. When the initial process subsides, the filiform papillæ atrophy. After recurrent attacks the epithelium is desquamated, causing the tongue to appear smooth, and on this background the affected fungiform papillæ stand out as shiny red spots (fig. III). The most striking symptom is the extreme sensitivity of the tongue and mouth, especially where there are aphthous ulcers. The patient winces with pain when partaking of anything but the blandest of diets; and salts and fruit juices cause pain and excessive salivation. Sprue tongue is usually described as narrow and pointed; but there are considerable variations. In long-standing cases there is generalised stomatitis. The edge of the tongue is indented by the teeth, and there may be excoriation of the angles of the mouth (cheilosis) producing an appearance identical with that of the pellagra tongue figured by Spies, and Cooper (1937) (fig. III).

Although I formerly believed that the changes in sprue tongue were specific, there now appears to be no essential difference between the glossitis and stomatitis of sprue at any stage and those of fully developed and of larval pellagra. Typical glossitis and stomatitis may precede gastro-intestinal manifestations in both pellagra and sprue. Moreover, œsophageal pain and dysphagia are common to sprue and pellagra and occasionally to pernicious anæmia. The gastroscopic appearances of sprue have been described by Olleros (1938) as identical with those of pernicious anæmia. Hence it is possible that an atrophic process involves the gastro-intestinal tract, producing a train of symptoms varying according to which particular part is most affected. This is probably true, because I have found by sigmoidoscopy that the rectal mucosa is hyperæmic in acute sprue associated with glossitis and bears a general resemblance to the changes seen in the tongue.

* It must not be concluded that all sore tongues are necessarily pellagrous. There are some forms of aphthous stomatitis, often associated with oral sepsis, which do not respond to nicotinic-acid therapy.

The number of patients with tropical sprue who have come under my care during the last twenty years has been considerable, and 500 of these with the well-marked signs and symptoms of the disease have been the subject of special study for the purpose of this paper. During the period 1920–28 a series of 200 were collected and analysed by H. Willoughby and myself (1930) with special reference to the significance of the glossitis; the following facts have emerged: Glossitis often develops as a preliminary manifestation of sprue when there is no anæmia; hence it appears to be unrelated to hæmolysis. In 156 cases out of 200 glossitis was a striking and characteristic symptom, and in no case was there severe anæmia when the glossitis was at its height, all the patients having blood-counts of 3,000,000 red cells and a hæmoglobin percentage of 70 or more. This makes it appear that the causes of the glossitis and of the anæmia are not necessarily the same. Taking all the glossitis cases observed, in 46% the tongue was red and raw, smooth and fissured in 19%, and ulcerated in 22·5%. There was inflammation of the buccal mucosa in 12·5%, and angular stomatitis in 11%. Dysphagia, or œsophageal pain, invariably associated with acute glossitis, was present in 12·5%.

One of the most striking facts which emerge from an analytical study of this large number of cases is the influence of previous acute intestinal disease or fever in determining the onset of sprue. In this respect the natural history of tropical sprue bears a strong resemblance to that of pellagra, in which chronic coincident intestinal or other debilitating infections so intimately determine its onset. In many cases this may be amœbic or bacillary dysentery or hill diarrhœa, in which symptoms may merge imperceptibly into those of sprue. In 200 cases specially analysed from this point of view diseases of the intestinal tract preceded the onset of sprue in 40·5%: in a further 36% malaria had preceded sprue. It therefore seems probable that chronic infections may undermine the bodily resistance and in this manner predispose to tropical sprue.

Therefore in tropical sprue there appear to be two factors at least: one determining the onset of glossitis and diarrhœa: the other causing the characteristic megalocytic anæmia. From the analogy of other well-known megalocytic anæmias it is permissible to postulate that the specific anti-anæmic factor is absent, as in pernicious anæmia, by the abundantly proved observation that the anæmia of tropical sprue responds to the administration of the extrinsic factor (liver) as effectively as it does in Addisonian pernicious anæmia, but in most cases of sprue the effects are lasting in restoring complete hæmopoiesis.

There is, however, the other factor to be considered, which may be held responsible for the glossitis and alimentary manifestations, and there are good reasons for supposing, on the analogy of pellagra, that this might also be the P.P. factor. A consecutive series of 20 patients presenting the well-marked syndrome of tropical sprue have been given intensive treatment with nicotinic acid.

The patients were Europeans from India, Burmah, Malaya, or China; thirteen of them were men and the ages ranged from 34 to 71 with an average of 51·5 years. Symptoms had been present for from 3½ months to 15 years. In thirteen patients this was the first attack of sprue, although one of these had left Burmah for England 25 years before; the remaining seven were having their 3rd to 7th relapse. Loss of weight during the attack ranged from 14 to 42 lb., average 20·5 lb. Glossitis only was present in fifteen cases and glossitis plus angular stomatitis in five; this condition had been noticed for from 6 months to 10 years. The patients' stay in hospital lasted 14–40 days, with an average of 23 days. The routine treatment was 150 mg. nicotinic acid daily for 14 days, but two patients received twice this dose and two others also received 3 mg. riboflavin daily for 7 days. In addition all the patients received intramuscular injections of Campolon, Anahæmin or Examen totalling 16–60 c.cm. One patient was operated on for a thyroid cyst, one for rectal polypus, and one had a tooth extracted.

Results.—Glossitis subsided, stomatitis healed and sense of taste returned in all cases in an average of 3 days. On an average the diarrhœa ceased in 4 days and the stools became formed and brown in 5–6 days. There was an adequate reticulocyte response. All the patients gained weight, the average rise being 10 lb.

The results show the favourable influence exerted mainly on the tongue and to a lesser degree on the stomach and intestines. In my opinion nicotinic acid has some influence on the stools, especially in early cases.

From an attempt to follow up these cases it seems necessary to continue treatment with nicotinic acid for at least three months. The end-result is that the tongue and buccal mucosa become normal, flatulence disappears, and the skin regains its healthy texture and elasticity. On the other hand, the blood-picture does not seem to be much affected by nicotinic acid; but this is a difficult question, because in combating the anæmia the cruder extracts of liver, such as campolon and anahæmin, are employed, which also contain vitamin-B_2 complex.

During the last thirty years I have compared the effects of various forms of treatment on sprue. With the rigid milk treatment, as originally practised by Manson, glossitis was most intractable, but in 1926–36, since the introduction of parenteral liver therapy, the glossitis has abated much more speedily. Finally, nicotinic acid has given the best results in glossitis. Justin-Besançon et al. (1939) have also reported the favourable action of nicotinic acid in long-standing sprue.

A comparatively simple and practical method of assessing the curative value of treatment is the computation of the average stay in hospital. In the series treated with nicotinic acid in 1939–40 this was 22½ days, whereas in 1920–28, in the 200 patients who were mainly on a milk dietary and were under observation by me, it was 54 days, and in a series of 50 patients on a high-protein diet in 1930–32 it was 25 days.

Riboflavin has a curative effect as an adjunct to nicotinic acid. This was noted in three of my cases, who also had angular stomatitis (cheilosis). After the administration of riboflavin 3 mg. daily these lesions and an atrophic condition of the perianal skin healed.

ÆTIOLOGY OF TROPICAL SPRUE

Elders (1917) maintained that tropical sprue was a deficiency disease, not an infection or toxæmia. McCarrison (1921) produced a sprue-like syndrome and atrophic changes in the small intestine of monkeys fed on a vitamin-free diet. Wood (1925) emphasised the fact that sprue first attracted attention in the United States when pellagra made its historic appearance in 1907. He hinted that they might have a common ætiology, and pointed out that the blood-picture in sprue was strikingly similar to that of pernicious anæmia. Tjiook Kiem-Bok (1939) produced experimental blacktongue in dogs by an inadequate diet but found no increase in the fat in the stools; with the same diet he produced a macrocytic hyperchromic anæmia with hyperplastic changes in the bone-marrow in a monkey (*Macacus rhesus*) and a flat blood-sugar curve (as in sprue) which was attributed to decreased absorption from the intestines.

Studies of the pathological anatomy of sprue have not revealed any constant distinctive lesions in the intestines; in this respect tropical sprue is comparable with uncomplicated pellagra, pernicious anæmia, and idiopathic steatorrhœa.

In 1 case I found superficial follicular ulcers in the ileum (Bahr 1915). In 1924 I reported 2 cases in which death was due to perforating ulcers of the ileum. Similar instances have been recorded by Faber (1904), Justi (1913), Fischer and von Hecker (1922); but Mackie and Fairley (1934) and Thaysen (1932), who have conducted thorough examinations of freshly fixed tissues, have concluded that minor changes in the mucosa and villi which have been described are due to degeneration and aplasia. There are strong indications, on clinical, biochemical, and analogical grounds, that the main defect in tropical sprue does lie in the small intestine and to a lesser extent in the large. It has long been known that certain easily recognisable diseases, or alterations in the absorption and secretion of the small intestine, may produce the clinical picture of sprue. Such are affections of the mesenteric glands interfering with fat absorption by the lacteals, as described by Allchin (1907) in tabes mesenterica and by me (1939) in an officer who had recurrent symptoms of sprue with glossitis for ten years. Malignant disease of the mesenteric glands may also produce the clinical picture of sprue. In 1928 I had such a case from Siam with glossitis, megalocytic anæmia, emaciation, and steatorrhœa caused by lymphadenoma of the mesenteric glands. Fairley and Mackie (1937) have described a further 4 cases in patients who had exhibited the clinical picture of sprue in life and had the biochemical background held to be characteristic of that disease.

Other mechanical changes interfering with the normal function of the stomach and intestines may also produce the sprue syndrome with glossitis, such as gastrojejunocolic fistula, to which attention was drawn by Fairley and Kilner (1931) and by De Rivas (1930). Defective absorption of essential foods after short-circuiting of the small intestine is obviously in this case the basis of the glossitis and anæmia closely mimicking sprue. It is probable that the glossitis of gastrojejunocolic fistula will be found to respond to nicotinic acid.

CLINICAL PATHOLOGY OF TROPICAL SPRUE AND OF PERNICIOUS ANÆMIA

Since achylia gastrica almost invariably accompanies pernicious anæmia it is surprising that, as Ungley (1929), and Meulengracht (1934) reported, the stomach in pernicious anæmia shows atrophic changes with destruction of the parietal cells, while the pyloric glands escape and Brunner's glands appear normal. Meulengracht believes that this apparent contradiction between physiological disturbance and anatomical change can be explained solely on the basis of disturbed function. The visible lesion in the body of the stomach in pernicious anæmia and in sprue, as seen by gastroscopy, is a diffuse atrophy which may be ascribed to nutritional changes.

But in tropical sprue we are faced with a further difficulty. The intrinsic antianæmic factor is absent in sprue, as has been shown by Castle and Townsend (1929). This absence cannot be correlated with the hydrochloric-acid content of the gastric juice, because in typical tropical sprue the acid curve is often normal, as shown by the fractional test-meal; moreover, in cases running an equally typical clinical course achlorhydria and achylia gastrica may be found; rarely, too, hyperchlorhydria of the duodenal type may be met with. In fact in sprue, as shown in my series of 500 cases, the presence or absence of hydrochloric acid appears to have little influence on the progress of the disease or the severity of the anæmia. In this respect tropical sprue seems to fall into line with idiopathic steatorrhœa and pellagra.

These observations may be considered with the generally recognised observation that in tropical sprue complete clinical and hæmatological recovery is often obtained, even in desperate cases, whereas in pernicious anæmia relapses often take place, unless maintenance doses of liver are continued. Moreover, in this series of sprue cases the average age at onset was over 45. Spontaneous recovery on removal from the endemic area in the tropics is naturally commonest in comparatively young people, and numerous patients have returned to the tropics and remained well after recovery from a desperate attack of sprue.

Thus, 4 illustrative cases may be briefly cited. There were 2 of the most severe type in young women, aged 24 and 30, from India, after childbirth. Both presented the clinical picture of severe anæmia, with subcutaneous and retinal hæmorrhages and œdema. Both gave high indirect van den Bergh reactions, and both had cramps and tetany. In both complete hæmatological and clinical recovery took place three months after the start of treatment. Another woman, aged 68, from Shanghai, had had sprue, with great emaciation, diarrhœa, and glossitis, for five years with resulting severe anæmia, associated with subcutaneous and retinal hæmorrhages (red cells 1,005,000; Hb. 30%). On dietetic and liver therapy she made a complete recovery and within six months had gained 32 lb. in weight. She is now 74 and in good health and shows no signs of sprue. The fourth case was in an Army officer, aged 47, who had been invalided from India with sprue in 1930. He was then almost moribund, but he made a complete recovery, and his case has been followed up for the last seven years, during which time he has shown no signs of the disease.

GLOSSITIS AND STOMATITIS OF LARVAL SPRUE

On several occasions during the last twenty-eight years I have drawn attention to a condition in which the sprue process remains confined for a considerable period, it may be for months or as long as a year, to the buccal cavity, to be succeeded later by intestinal symptoms and the characteristic anæmia. I originally called this condition "tongue sprue" (fig. IV). At first the possibility that there was larval sprue was considered to be remote,

but the experience of later years has confirmed my original ideas. In Ceylon I saw 7 cases in Europeans, male and female, in whom this sequence was noted. Since then I have watched the development of typical sprue in 6 cases. In this respect also tropical sprue and pellagra fall into line.

CASE 3.—A man, aged 55, from India, was seen in December, 1928, when he had an acute and distressing stomatoglossitis, with salivation, of three months' duration. At that time there was no gastro-intestinal disturbance or anæmia. Three months later typical sprue supervened, with typical bulky fatty stools (total fat 33%) and megalocytic anæmia. Aphthous ulcers were then present on the tongue and buccal mucosa. On dietetic and liver therapy he made a satisfactory recovery.

Of the 5 other patients, 3 had spent twenty to forty years in India, Hong-Kong, and Malaya. All of them developed the sprue syndrome with emaciation, typical megalocytic anæmia, and steatorrhœa. Sprue glossitis had preceded the onset of diarrhœa by three months to a year. There were 3 males and 2 females, aged 41–72. One woman, aged 72, had been observed on seven occasions in 1928–34, and on each occasion the glossitis preceded the onset of sprue relapse by one to three months. Conversely, sprue glossitis may rarely be a late or even a terminal phenomenon.

(To be concluded)

LUNG ABSCESS TREATED WITH M. & B. 693

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CLINICAL ASSISTANT AT THE COLLEGE; AND

NAND LAL CHITKARA, M.B.

(With Illustrations on Plate)

SINCE the introduction of M. & B. 693 in the treatment of pneumococcal infections, 7 cases of lung abscess have been treated in the Mayo Hospital, Lahore. Results in 3 of these cases were dramatic. Of the 7 cases 3 followed pneumonia; the cause in the 4 other cases was not clear. None of them followed dental extraction or operations on the upper respiratory passages; this confirms the findings of Shah in Bombay (*Ind. med. Gaz.* November, 1939) that tonsillectomy and dental extractions are rarely a cause of lung abscess in India.

DIAGNOSIS

The diagnosis was made on the symptoms, physical signs, and examination of sputum and was confirmed by radiography. Examination of the sputum of the 7 cases showed:

Case
1—Streptococci (*Bacillus subtilis*—probably contamination).
2— ,, (long-chained and pneumococci type III.
3— ,, and pneumococci (not typed).
4—Staphylococci and *Micrococcus catarrhalis*.
5—Streptococci (medium- and long-chained).
6—Pneumococci group 4.
7—Streptococci and pneumococci.

Typing of pneumococci was possible in only 2 cases, because facilities were not available earlier. Typing of streptococci was not possible. The Wassermann reaction was positive in 2 cases. We have also often found evidence of old syphilis in cases of unresolved pneumonia in the wards here. All the cases were controlled by radiography.

TREATMENT

All 7 patients were treated with M. & B. 693: 5 with tablets, and the other 2 by injections. The dose in tablets was that usually given in pneumonia—i.e., 2 g. on admission, 2 g. after four hours, then 1 g. four-hourly. In 4 of these cases vomiting began within a few hours, so the treatment had to be abandoned. Later, when M. & B. 693 soluble became available, we began to use injections. Three injections of 1 g. each daily for seven days were given in one case, and two injections daily for three days in another, the course being repeated after a week in the second case.

CASE-RECORDS

CASE 1.—A Sikh male, aged 60, had had two and a half months' fever, pain in the right side of the chest, and cough with large quantities of purulent yellow sputum. The temperature ranged between 102° and 103° F. When he turned on the left side, a large quantity of sputum was coughed up.

On examination his general condition was serious, and he was thin and poorly nourished. Sputum bloodstained, purulent, and copious. Temperature in hospital before treatment up to 101° F. Pulse-rate 110–85. Examination of his chest revealed signs of consolidation in the right middle zone. Streptococci and *B. subtilis* (contamination) were grown from his sputum. A blood-count showed 9600 leucocytes, of which 79% were polymorphs. Radiography of his chest showed an area of consolidation in the right middle zone, in the centre of which there was an area of lesser density with a fluid level (fig. I).

Treatment and result.—Tablets of M. & B. 693 were not tolerated because of vomiting. Injections of M. & B. 693 1 g. were given twice daily for seven days and repeated after three weeks. Postural drainage with Nelson's bed was tried, but he could not tolerate the position. His temperature came down to normal within twenty-four hours and remained so. His general condition rapidly improved, sputum ceased, and he was discharged after seven weeks with no symptoms or clinical signs. Radiography on his discharge showed root shadows on the right side increased, with fibrous bands spreading outwards in the middle zone. The consolidation and abscess cavity had completely disappeared (fig. II).

CASE 2.—An Indian Christian, aged 47, had had six weeks' fever, beginning with acute pneumonia. The temperature ranged up to 102° F. and pulse-rate up to 108. Cough with large quantities of thick yellow purulent sputum. Change of position in bed led to bouts of severe coughing and the production of large quantities of sputum. Before admission he had had attacks of severe hiccup, which began after tablets of M. & B. 693 had been given by mouth.

On examination his general condition was serious and very toxic. Temperature 102·6° F., pulse-rate 120, respiration-rate 32. Left middle and lower zones: diminished movements, a very dull percussion note, diminished and absent breath sounds at the base, and diminished and absent fremitus and bronchophony. Because of these signs, before admission to the hospital, a needle had been put into the chest, but no fluid had been found.

A blood-count showed 22,000 leucocytes, of which 89% were polymorphs. Sputum grew long-chained streptococci and pneumococci type III. Radiological report: "Whole of left lung covered with faint homogeneous shadows. There is a circumscribed shadow of lesser density with fluid level in the left middle zone suggesting a lung abscess. The left diaphragm is at a higher level than the right, and heart and trachea are displaced to the right" (fig. III).

Treatment.—Three injections daily of M. & B. 693 (1 g. ampoule) for four days. Temperature came down to normal after five days and remained normal. The general condition improved miraculously in the course of a week. Sputum gradually became less. When his condition had improved, postural drainage by a Nelson's bed was used with a slight benefit. He remained only seventeen days in hospital and was on his feet before he left.

In this case the severe continuous hiccup stopped after a week's treatment. We thought it to be due to irritation of the diaphragm and its upward displacement (see fig. III) or possibly to the gastric irritation of M. & B. 693 tablets taken by mouth.

Radiography on Dec. 5, 1939, four months after onset, shows "disappearance of abscess and opacity. The left side of diaphragm is pulled up, and the interlobar septum is thickened and pulled downwards" (fig. IV).

CASE 3.—A Hindu male, aged 35, had had a month's cough, fever, and weakness. There was a copious offensive expectoration when he sat up. On examination: temperature 101° F., pulse-rate 100, respiration-rate 24. He coughed up 6 oz. of sputum on his first day of admission to hospital. Chest: flat percussion note over right lower lobe, where there were

distant breath sounds and crepitations. Sputum grew streptococci and pneumococci. A blood-count showed 13,600 leucocytes, of which 81% were polymorphs. Radiography showed right lung upper and middle zones heavy striations, with consolidation of lower zone. There is an area of lesser density resembling an abscess cavity in the middle zone.

Treatment.—Tablets of M. & B. 693 12 g. in all. Nelson's bed postural drainage. Temperature came down within twenty-four hours and remained normal. General condition rapidly improved, sputum became less, and he left the hospital against our advice after nine days, because his condition had so much improved. We have not seen the patient after discharge and so cannot report on his final condition.

CASE 4.—A Hindu male, aged 30, had had eight months' cough, six weeks' copious foul-smelling sputum, and a week's fever. Cough persisted after an attack of lobar pneumonia eight months ago. He coughed up a large quantity of sputum when he woke up and turned on the left side. On examination: temperature 98·4°–100° F., pulse-rate 105, respiration-rate 24. On admission he was coughing up 6–7 oz. of sputum daily. On the right side of the chest there were lessened movements, increased fremitus, a dull note, and bronchial breathing with crepitations.

Staphylococci and *M. catarrhalis* were grown from the sputum. The Wassermann reaction was positive. A blood-count showed 10,250 leucocytes, of which 10% were polymorphs. Radiological report: "Upper and middle zones very heavy striations, lower zone shows consolidation. In the middle zone there is area of lesser density resembling lung abscess" (fig. V).

Treatment.—Tablets of M. & B. 693, only 4 g. being given. There was persistent vomiting; so the drug was stopped. With Nelson's bed postural drainage there was a slight benefit. Temperature came down with Nelson's bed treatment, but went up again after two days. Vaccine treatment was begun, but he was given only three injections, when he was discharged at his request. Injections of M. & B. 693 were not then available. Antisyphilitic treatment was given.

CASE 5.—A Mohammedan male, aged 48, had had three months' pain in right chest, fever and cough, with a large quantity of purulent offensive and bloodstained sputum. On examination he appeared well nourished. Temperature 98°–101° F., pulse-rate 100, respiration-rate 24. In the chest the right middle zone gave a flat percussion note, with distant breath sounds and crepitations.

Medium- and long-chained streptococci were grown from the sputum. The Wassermann reaction was positive. The blood-pressure was 120/80 right side, and 100/65 left side. A blood-count showed 11,600 leucocytes, of which 76% were polymorphs. Radiological report: "Right upper zone increased striations, area of consolidation lower zone with a central less denser area with fluid level. Area of consolidation is continuous with the root shadow" (fig. VI).

Treatment.—Tablets of M. & B. 693 could not be tolerated, owing to incessant vomiting. Nelson's bed postural drainage did not prove of much value. The temperature did not come down, nor did the symptoms abate, and the patient left after twenty-eight days in hospital. Injections of M. & B. 693 were not then available. Antisyphilitic treatment was given.

CASE 6.—A Mohammedan male, aged 33, was admitted as a case of lobar pneumonia with a history of three days' fever of sudden onset. On examination he appeared to be in a condition of poor general nutrition. Chest showed consolidation of the right middle lobe and left lower lobe. The spleen measured four finger-breadths, probably owing to malaria. The sputum was bloodstained and grew pneumococci group 4.

A blood-count showed 12,500 leucocytes, of which 80% were polymorphs. His Wassermann reaction was negative. Radiological report: "Right side: there is generalised haziness of the entire lung field with an area of consolidation in the lower zone. There is fluid level in the centre of this area suggestive of lung abscess" (fig. VII).

Treatment.—M. & B. 693 tablets 40 g. were given in two months. At first he responded, but the temperature went up again after six days, and he did not thereafter respond to the drug. He died after two months in the hospital.

CASE 7.—A Mohammedan male, aged 50, had had twenty days' cough and fever. He was wasted and extremely ill. Breath and sputum smelled foul. He was admitted moribund. Temperature 96°–98·2° F., pulse-rate 88, respiration-rate 22. The right side of his chest gave a dull percussion note, with cavernous breath sounds. Copious and foul-smelling sputum produced pneumococci and streptococci (not typed). A blood-count showed 21,000 leucocytes. Radiological report: "Diffuse mottling both lungs with a denser shadow and fluid level at the right base suggestive of lung abscess." The patient received 10 tablets of M. & B. 693, but died before more could be given. Injections were not available.

SUMMARY

In 3 of 7 cases of lung abscess there was striking improvement after giving M. & B. 693. The drug was given by injection in 2 cases, and only 2 others could tolerate an adequate dosage by mouth.

None of these cases followed operation on the upper respiratory passages, but 3 of them followed lobar pneumonia.

The Wassermann reaction was positive in 2 cases. We have often found syphilis associated with unresolved pneumonias in the Punjab.

POSTPARTUM NECROSIS OF THE ANTERIOR LOBE OF THE PITUITARY

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(*With Illustrations on Plate*)

EARLIER papers (Sheehan 1937, 1939, Sheehan and Murdoch 1938a and b, 1939) deal (1) with the ætiology and pathology of the ischæmic necrosis of the anterior lobe of the pituitary that follows the collapse of patients at delivery, usually as a result of severe obstetric hæmorrhage, and (2) with the clinical aspects and pathology of the Simmonds's disease that follows when a patient with a large necrosis survives the puerperium. The literature has been reviewed in those papers, but certain subsequent publications, containing descriptions of 2 new cases of early necrosis and of 8 new cases of postpartum Simmonds's disease, 5 of which came to autopsy, may be briefly noted.

Brown and Eder (1939) give a full history of the obstetric course and pathological findings in a woman who died four days after delivery. She had had a retained placenta which caused severe collapse, though hæmorrhage was only moderate. At autopsy early necrosis of most of the anterior lobe of the pituitary was found.

Gotshalk and Tilden (1940) give obstetric and pathological details of a woman who died three days after delivery. She had had severe hæmorrhage and repeated collapse for several hours after the delivery. At autopsy there was an early necrosis of nearly all the anterior lobe.

Farquharson and Graham (1931) reported 2 living cases of postpartum Simmonds's disease. Farquharson, Belt, and Duff (1938) have now given a clear account of the subsequent histories and findings at autopsy in these 2 cases and add a third which is also typical and was proved at autopsy. Their case 4 died of carcinoma of the cervix and was greatly emaciated (weight 70 lb.); the 2 other patients weighed 105 lb. and 115 lb. Case 4 had a retained placenta at the significant delivery, but obstetric details are not given in the 2 other cases.

Lichtenfeld (1938) gives an excellent clinical and pathological account of 2 cases, both of which followed severe hæmorrhage at delivery. The patients weighed 133 lb. and 145 lb. at death.

Goldzieher (1939) gives a clinical description of a case (his case 1671/38) which followed a delivery at which the patient had had hæmorrhage from a placenta prævia. Her weight nineteen years later was 110 lb.

Stephens (1939) records clinical details of 2 cases (his cases 6 and 7) which followed difficult deliveries requiring operation and accompanied by hæmorrhage and shock which necessitated transfusion. One patient subsequently lost 15 lb. in weight, and the other's weight went down from 118 lb. to 82 lb. Such a loss is very unusual in cases of this type. Excluding the case with carcinoma, the mean of the six weights recorded in these four papers is 115 lb. This is in reasonable agreement with the mean weight of the other patients with postpartum Simmonds's disease (Sheehan 1939).

Only in the first two of these six papers does there appear to be any clear recognition of the pathology and ætiology of the original lesion of the pituitary. It therefore appears useful to emphasise this aspect by recording 10 further cases of recent or healed necrosis of the pituitary that have been found in a series of 95 obstetric autopsies.

In this series 52 of the patients had had no collapse or significant hæmorrhage at delivery; they died at various times between early pregnancy and late puerperium. They had not been subject to factors that cause necrosis of the pituitary, and, as would be expected, none of them showed any fresh lesions of this kind.

The remaining 43 patients had had various degrees of collapse and hæmorrhage at delivery, and 33 of them had died within fourteen hours after delivery. These 33 patients had not had time to develop any definite necrosis, but several of those who had died a few hours after delivery showed a peculiar histological appearance in the anterior lobe of the pituitary: the parenchyma cells, while retaining their ordinary relationships to one another and their normal histological characters, had become separated en masse from the interalveolar septa, thus leaving a clear space at the periphery of each alveolus. The condition involved nearly the whole lobe, and it looked as if the shrinkage due to fixation and embedding had affected the parenchyma cells in the ordinary way but not the septa. It was not due to post-mortem autolysis, because nearly all the autopsies were performed within two hours after death; further, the cells were not separated from each other as in an autolysed gland. It was not due to variations in fixation and embedding, for this was done according to a standard routine in all cases. This histological picture is common though not invariable in patients dying six to twelve hours after severe obstetric collapse, and it was not seen in any of the 52 patients who had not had collapse or hæmorrhage. Presumably it is a sign of incipient necrosis. No reliable information can be given here about whether or not a gland with this histological appearance is œdematous before fixation.

The remaining 10 patients who had had hæmorrhage or collapse at delivery died later in the puerperium. Of these, 2 had been desperately ill from this cause at delivery, and both had gross necrosis of the anterior lobe of the pituitary. The 8 others had had moderately severe collapse or hæmorrhage at delivery but had not been so seriously ill; 4 of these had small necroses of the pituitary, and the other 4 had none.

As an incidental finding unrelated to the final pregnancy, 4 multiparæ had the scars of small necroses of the pituitary that had taken place years before.

The histories of the 10 patients with recent or with healed necroses were as follows.

RECENT LARGE NECROSES

CASE 1.—Aged 37, 7-para. The previous pregnancies and deliveries were normal. Apart from an attack of erythema nodosum she was well during this pregnancy and continued to term. She had a precipitate delivery, and immediately after the birth of the baby there was an enormous hæmorrhage, which produced desperate collapse and deep unconsciousness. Three hours later, since the placenta could not be expressed and the patient seemed on the point of death, she was given 500 c.cm. of blood and 1000 c.cm. of glucose-saline intravenously. Most of the placenta was then removed by hand, but the remainder, being accrete, was left. The patient continued apparently moribund until fourteen hours after delivery, when the pulse became palpable, though the rate was uncountable, and consciousness was partly regained. The next day she was still extremely ill but had some pyrexia; she also developed thrombosis of the left axillary artery and a transient uræmia due to the loss of blood. Since the diagnosis of a large necrosis of the pituitary was certain from her history, she was given large amounts of glucose for several days, but the pyrexia continued, and signs of uterine infection became obvious. On the ninth day after delivery she died from septic endometritis and thrombophlebitis due to infection of the large mass of placenta which remained adherent in the uterus. At no time in the puerperium did the breasts show any swelling or lactation.

At autopsy the anterior lobe of the pituitary was almost completely necrosed. The extent and character of the lesion are illustrated in fig. I, which shows a horizontal section through the upper half of the gland. The small amount of anterior-lobe tissue which remains alive is seen in two places: (*a*) as a dark cap over the base of the stalk where it projects forwards from the posterior lobe, and (*b*) as a thin dark line directly under the capsule; this is most obvious at the two sides behind and at the middle line in front. Beneath this live tissue there is a rather thin pale band, which is continuous round the entire lobe; this is the zone of secondary atrophy which develops round any necrosis of the pituitary of about this age. All the tissue to the inside of this zone is completely necrosed; the broad outer dark zone in the photograph is a band of polymorph infiltration, and the pale centre is the part beyond the range of invasion of these cells. Microscopically the necrosis is clearly several days old.

As mentioned earlier, the causes of necrosis of the anterior lobe of the pituitary are severe collapse and/or hæmorrhage at the delivery. In case 1 these factors were both present in an extreme degree and for a long time; hence necrosis of nearly all the anterior lobe of the pituitary was inevitable. The histological appearances are in agreement with the view that the necrosis was nine days old. The patient would certainly have developed Simmonds's disease if she had survived the puerperium.

CASE 2.—Aged 24, 3-para. In her first two pregnancies she had had hypertensive toxæmia, but the deliveries were normal. In this pregnancy she was well until the thirty-seventh week, when she developed typical signs of gross uteroplacental apoplexy and became desperately collapsed. Four hours later she was given 700 c.cm. of glucose-saline followed by 700 c.cm. of blood intravenously, and the pulse became palpable again, though the rate was uncountable. She remained in much the same condition until after delivery eighteen hours later; the fœtus was stillborn, and the retroplacental clot weighed 1250 g. There was no real improvement until two hours after delivery, when she was given another transfusion of 700 c.cm. of blood; after this her pulse-rate fell to 140, and she began to recover. During the puerperium she was given much intravenous glucose, because it was clear that she must have a large necrosis of the pituitary, but she developed endometrial sepsis and septicæmia and died thirteen days after delivery. The breasts shrank rapidly without any treatment during the puerperium and never showed any sign of lactation.

LEGENDS TO ILLUSTRATIVE PLATE

DR. MANSON-BAHR

I—Glossitis and angular stomatitis in pellagra in a Turkish prisoner of war in Egypt, 1917, from Enright's series.

II—Glossitis and angular stomatitis in larval pellagra (case 1) which responded immediately to treatment with nicotinic acid. England, 1939.

III—Acute glossitis and angular stomatitis in sprue relapse. Note marginal indentations. There was an immediate response to treatment with nicotinic acid.

IV—Glossitis in larval or tongue sprue, showing appearance of tongue six months before onset of sprue syndrome. Ceylon, 1912.

V—Acute glossitis and angular stomatitis in a case presenting features of pernicious anæmia and sprue with achylia gastrica. Response to treatment with nicotinic acid.

VI—Glossitis of pernicious anæmia in a patient who subsequently developed subacute combined degeneration of the spinal cord.

VII—Stomatitis and glossitis in a fatal case of idiopathic steatorrhœa.

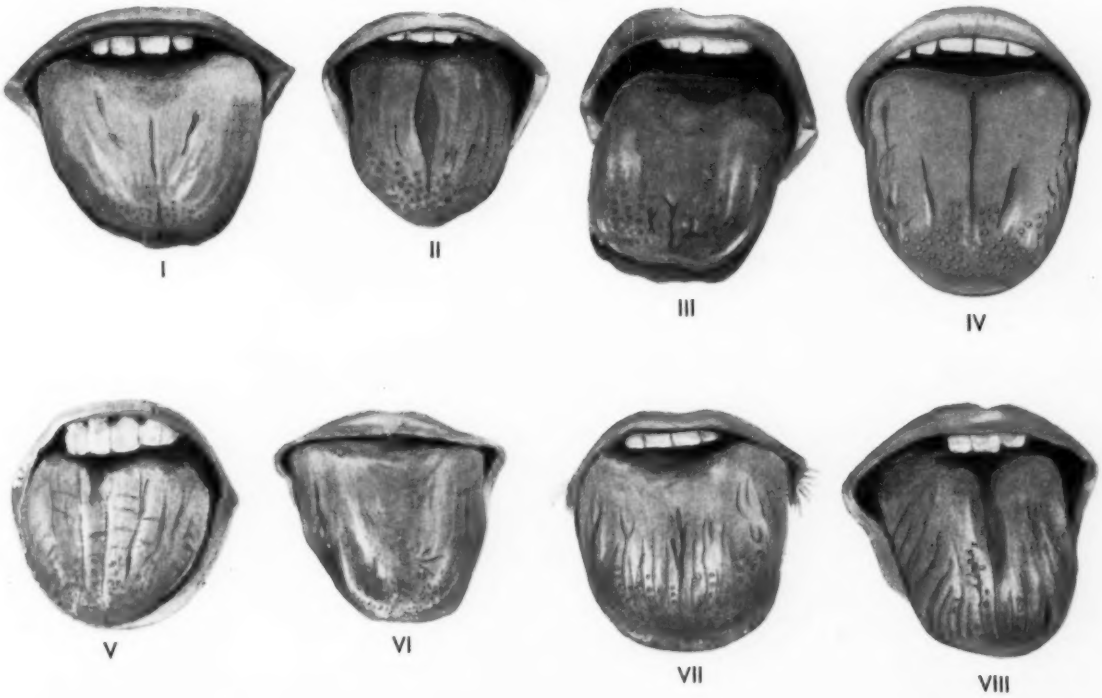
VIII—Glossitis and angular stomatitis in a case presenting features of sprue, pellagra, and idiopathic steatorrhœa from Southern Rhodesia (case 12).

PROF. TAYLOR AND OTHERS

I—Case 1 before treatment, Oct. 13, 1939.
II—Case 1 after treatment, Nov. 29, 1939.
III—Case 2 before treatment, Aug. 31, 1939.*
IV—Case 2 after treatment, Dec. 5, 1939.
V—Case 4 before treatment, Oct. 1, 1939.
VI—Case 5 before treatment, Aug. 31, 1939.
VII—Case 6 before treatment, March 8, 1938.

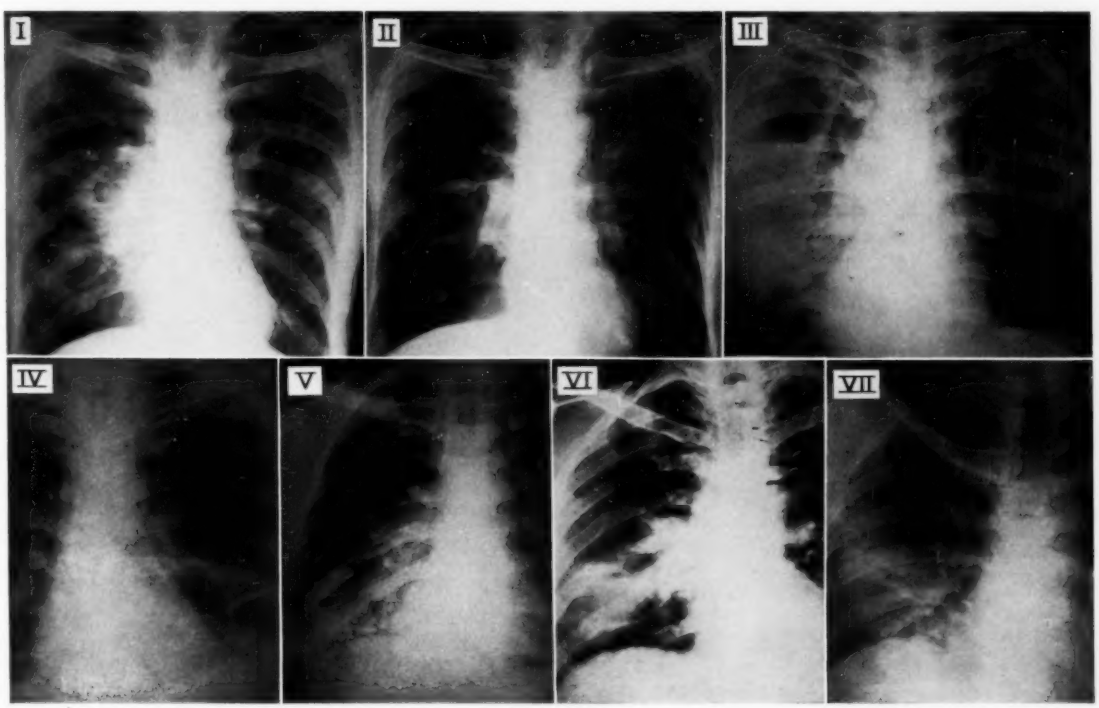
* This radiogram has been reversed in reproduction.

DR. MANSON-BAHR: GLOSSITIS AND VITAMIN-B_2 COMPLEX IN PELLAGRA AND SPRUE

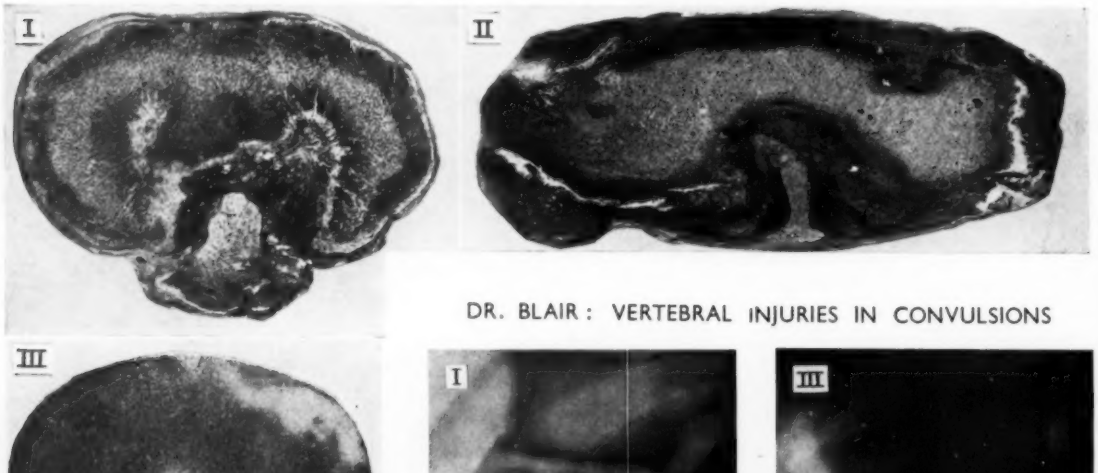


Philip Manson-Bahr pinxit

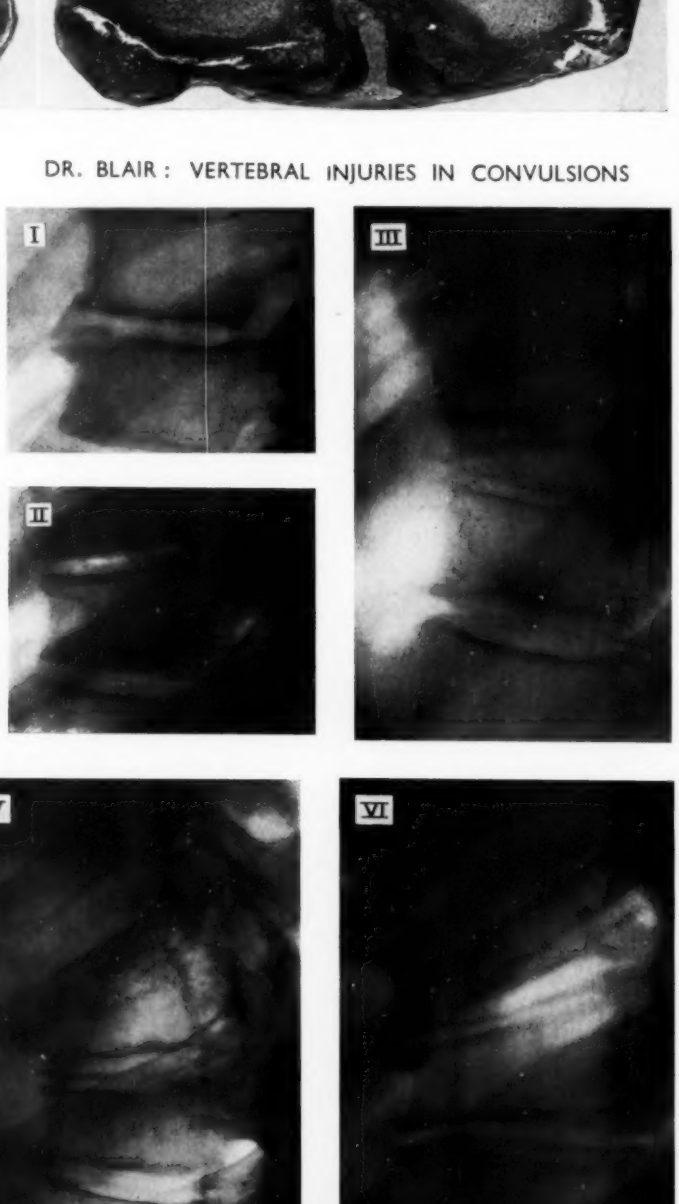
DR. TAYLOR AND OTHERS: LUNG ABSCESS TREATED WITH M. & B. 693



DR. SHEEHAN: POSTPARTUM NECROSIS OF ANTERIOR LOBE OF PITUITARY



DR. BLAIR: VERTEBRAL INJURIES IN CONVULSIONS



At autopsy the anterior lobe of the pituitary was almost completely necrosed. Fig. II shows a horizontal section through the gland at the upper end of the posterior lobe. The part of the anterior-pituitary tissue which remained alive is seen as a small darkish area on each side of the base of the stalk, with a continuation outwards as a thin dark line under the capsule on each side. The zone of secondary atrophy forms a pale band beneath this live tissue; it is seen most easily in the angle to the left of the stalk but can also be traced microscopically in most places beneath the thin surface layer of live gland tissue. All the remainder of the anterior lobe of the pituitary is in a condition of advanced necrosis; it shows a broad outer band of gross infiltration by polymorphs, which appears dark in the photograph, and a pale centre, where the necrosed tissue is not invaded by these cells. The infiltration by polymorphs was so severe that in places it produced pus, with local destruction of the necrosed tissue; streptococci were found in this pus similar to the organisms in other parts of the body. As a result of this infection the gland was soft and was damaged in removal, giving the torn appearance seen at each side of the gland.

This case is much like the first. The standard ætiological factors for a large necrosis were both present: prolonged and extreme collapse and gross loss of blood. The histological appearances were in keeping with a necrosis thirteen days old. The purulent reaction round the dead tissue was clearly a secondary change due, at any rate partly, to infection carried from the uterus. If the patient had survived she would certainly have developed Simmonds's disease.

RECENT SMALL NECROSES

CASE 3.—Aged 27, primipara. She had mitral stenosis of moderate severity and became decompensated two weeks before delivery. She was allowed to continue in labour for six days, during which time she became progressively worse. Finally she became desperately ill and apparently moribund; at this almost hopeless stage she was given ether anæsthesia and delivered rapidly with forceps. There was very little hæmorrhage. About two hours later there was a change for the better, and she improved gradually for four days, but she developed bronchopneumonia and died five days after delivery.

At autopsy the anterior lobe of the pituitary showed three areas of necrosis (seen as pale areas in fig. III), which appeared to be a few days old but had no infiltration by polymorphs and no zone of secondary atrophy. This is in keeping with their age.

The collapse was serious but not maintained for long and not accompanied by hæmorrhage. The resultant necroses are thus only small and would not have caused symptoms of hypopituitarism if the patient had survived.

CASE 4.—Aged 41, primipara. Her pregnancy was normal, but she had a contracted pelvis. After five days in labour she was delivered by cæsarean section under gas-oxygen-ether. Her condition at operation was not good, and there was some difficulty in the operation, but hæmorrhage was not excessive. For a few hours after the operation her pulse-rate was 120–130, but this was not sufficient to cause any alarm. She died six days later from general peritonitis.

At autopsy the anterior lobe of the pituitary showed a small necrosis in the middle line (fig. IV). The necrosis appeared microscopically to be several days old but had no polymorph infiltration or zone of secondary atrophy.

The patient had a minor dystocia-collapse without serious hæmorrhage. The resultant necrosis of the pituitary is small and would probably not have occurred at all if the patient's condition at delivery had been even slightly better. The lesion would not cause any symptoms.

CASE 5.—Aged 44, 8-para. Her previous pregnancies and deliveries were normal. In the twenty-seventh week of this pregnancy she had hypertensive toxæmia and continuous oozing of blood from the cervix for a few days. The bleeding was due to a hydatid mole; this was removed under ether anæsthesia. Her condition after operation was unsatisfactory, with a pulse-rate of 140 and some mental confusion, and she was given a blood-transfusion a few hours later. She developed sepsis and renal insufficiency and died two and a quarter days after delivery.

At autopsy a small necrosis was found near the centre of the left side of the anterior lobe of the pituitary. It was only about the size of that in case 4 and appeared histologically to be about two days old.

The patient had some collapse after the operation, probably due to the combination of the toxæmia and the gradual loss of blood previously. Her general condition was, however, not serious, and the resultant necrosis of the pituitary was only small—insufficient to produce symptoms. It is of interest that a hydatid mole can prepare the ground for a necrosis of the pituitary in the same way as a normal pregnancy.

CASE 6.—Aged 32, primipara. She had a severe mitral stenosis and was slightly decompensated during this pregnancy. During labour she developed a pulse-rate of 130 and evidence of serious cardiac failure; so delivery was completed with forceps under gas-oxygen-ether anæsthesia. There was only moderate hæmorrhage during removal of the placenta. During the next twenty-four hours she appeared ill and the tachycardia continued. She improved slowly for a few days but then became progressively decompensated, dying on the eleventh day after delivery.

At autopsy there was a small area of necrosis in the right side of the anterior lobe of the pituitary just below the surface, showing a general similarity to the necrosis in that region in case 3. It appeared histologically to be several days old, but the zone of secondary atrophy was narrow.

In this case there was a minor collapse due to heart disease, and the hæmorrhage was not serious. The pituitary necrosis which resulted was small and insufficient to produce any symptoms.

HEALED SMALL NECROSES

CASE 7.—Aged 30, 8-para. In her first five deliveries she had always had some postpartum hæmorrhage, but this was never excessive. At her sixth delivery, when she was 27, she had a severe postpartum hæmorrhage about a quarter of an hour after delivery of the placenta and was admitted to this hospital in a state of collapse with a pulse-rate of 140. A transfusion of 800 c.cm. of blood was given four hours later, and she recovered slowly. She lactated normally and had no symptoms referable to hypopituitarism afterwards. The seventh delivery was normal, but at her eighth delivery she had a retained placenta with severe hæmorrhage and shock and died within two hours.

At autopsy the anterior lobe of the pituitary showed the typical scar of an old healed postpartum necrosis in the left side near the surface. This was about 3 mm. by 1 mm. The size of the gland was normal for pregnancy.

It is reasonably clear that a medium-sized necrosis took place in the anterior lobe of the pituitary at the sixth delivery as a result of the severe hæmorrhage and collapse. This was not large enough to produce any symptoms of hypopituitarism, and during the next three years it became absorbed and left a much smaller scar. This scar represents the condensed stroma of the necrosed area and of the zone of secondary atrophy which enclosed the necrosis in the late puerperium.

LEGENDS TO ILLUSTRATIVE PLATE

DR. SHEEHAN

I—Horizontal section through upper half of the pituitary, showing almost complete necrosis of the anterior lobe (case 1).

II—Horizontal section through the pituitary at the upper end of the posterior lobe, showing almost complete necrosis of the anterior lobe (case 2).

III—Anterior lobe of pituitary, showing three (pale) areas of necrosis (case 3).

IV—Anterior lobe of pituitary, showing a small (upper pale) area of necrosis (case 4). (The lower pale area is the lower end of the posterior lobe.)

DR. BLAIR

I—Chip fracture of upper anterior corner of Th. 9 (case 1).

II—Wedge fracture of Th. 6 (case 2).

III—Crushing and wedging of Th. 5 and 6 (case 3).

IV—Flattening of Th. 6, 7, 8, and 9 (case 5).

V—Crushing and wedging of Th. 5 and 6 (case 7, an epileptic).

VI—Gross crushing and flattening of Th. 6, 7, 8, and 9 (in an epileptic).

Probably there was also some hypertrophy of the remaining parenchyma of the anterior lobe of the pituitary during the next two pregnancies. The patient's general condition at the last delivery would almost certainly have produced a large necrosis of the pituitary if she had lived to the puerperium, but she died too early for any incipient lesion to become histologically recognisable.

CASE 8.—Aged 26, 4-para. According to her story the first two deliveries were normal, but the third, when she was 24, was complicated by severe postpartum hæmorrhage, and she was in bed three weeks. No further details can be ascertained. During the fourth pregnancy she developed signs of mitral incompetence. The delivery was normal, but auricular fibrillation began twelve days later, and she died on the sixteenth day of the puerperium.

At autopsy the pituitary showed two flat scars under the anterior surface. These were small (about 2 × 0·5 mm.) but showed the typical appearance of healed necroses.

It may be presumed that the original necroses took place at the third delivery, when she had the severe hæmorrhage. They were too small to produce any subsequent symptoms. At the last delivery there was no collapse or hæmorrhage; so no further necrosis took place.

CASE 9.—Aged 35, 6-para. One of the previous deliveries took place in this hospital and was certainly normal, but no information can be obtained about the others. At the last delivery she had a severe hæmorrhage from a placenta prævia and died intra partum.

At autopsy there were two small scars in the anterior lobe of the pituitary: one near the centre of the right side (about 1 × 1 mm.) and one near the surface on the left side (about 1 × 0·5 mm.). These had the typical appearance of healed necroses.

It is impossible to say at which of the previous deliveries the necroses took place, but the lesions were too small to produce any symptoms. If the patient had survived the last delivery she would almost certainly have had a large necrosis of the pituitary.

CASE 10.—Aged 40, 10-para. The history of the previous deliveries is not known. At this delivery she had uteroplacental apoplexy but was not seriously shocked; her pulse-rate was only 80. She died of cortical necrosis of the kidneys seven days after delivery.

At autopsy a small scar was found under the surface of the right side of the anterior lobe of the pituitary (1·5 × 0·7 mm.). This had the typical appearance of a healed necrosis.

The necrosis presumably took place at one of her previous deliveries, but it is impossible to say which one in the absence of any obstetric history. The lesion was too small to produce symptoms. The condition at the last delivery was not bad enough to cause any necrosis.

COMMENTS

Only 2 of these necroses would have been of serious clinical significance; the 8 others were small and harmless lesions whose importance lies in the fact that, from the standpoint of ætiology and pathology, they are minor grades of exactly the same condition as that found in the first 2 cases. Certain significant points may be noted about the early and late stages of postpartum necrosis of the anterior lobe of the pituitary (most of these are illustrated by the present cases, but the full evidence is given in the previous papers, in which 15 other cases with autopsy are recorded):—

(1) The necroses range in size from trivial lesions to those which destroy nearly the whole of the anterior lobe.

(2) They are the result of collapse of the patient at delivery, usually because of severe obstetric hæmorrhage. In a case of hæmorrhage the important matter is not so much the amount of blood lost as its effect in causing collapse of the patient. The obstetric collapse may also be due to other factors, such as heart-disease, toxæmia, dystocia, and those complications which are commonest in multiparæ, such as retained placenta and uteroplacental apoplexy.

(3) The incidence and the size of the necroses depend on the gravity of the patient's general condition at the delivery.

(4) The lesion develops in the first day after delivery and can only be found in patients who die after that time. Most patients who die in the puerperium do so as a result of some form of sepsis, particularly if the delivery has been complicated. The sepsis is not, however, a factor in the causation of the necrosis, though it may possibly lead to further damage as a result of secondary infection of the dead tissue in the anterior lobe.

(5) The lesion is not directly fatal, but it may produce hypoglycæmia in the puerperium and thus predispose to complications at that time.

(6) If the patient survives the puerperium, any subsequent symptoms of hypopituitarism are related to the amount of pituitary tissue which has been lost. There are no symptoms if the necrosis has not been of considerable extent.

One recent paper requires short consideration; it is a sequel to one by Sheehan and Murdoch (1938a), who recorded a follow-up of women some years after a delivery at which there had been hæmorrhage and collapse due to various causes. Effkemann and Müller-Jäger (1939) repeated this follow-up with certain modifications. They classify their patients purely according to the amount of blood lost (800–1600 c.cm.) but do not mention the essential point of whether any of their patients had been collapsed at the delivery, and, if so, how severe and how prolonged such collapse was. It is impossible to draw precise deductions from the table of their findings, because, presumably owing to misprints, 9 of their 13 totals do not agree with the figures given in the subdivisions, and because no control figures are given from patients who did not have postpartum hæmorrhage. Their general findings, however, remain clear and suggest that any necroses of the pituitary that had taken place at delivery had not been large. They accept the existence of a definite relationship between hypomenorrhœa, sterility, and adiposity, and the previous occurrence of postpartum hæmorrhage. On the other hand, the absence of any cases of more fully developed Simmonds's disease among their patients leads them to consider that this disease is not a result of postpartum hæmorrhage, though they believe that a patient who is predisposed to Simmonds's disease may also have a predisposition to postpartum hæmorrhage. This hypothesis does not take the pathological evidence into account and is not supported by any evidence in their paper. Most of their references are to anorexia nervosa unrelated to pregnancy. Consideration of anorexia nervosa under the title of Simmonds's disease is found in other recent papers (Cornil 1939, Curschmann 1939, Loos 1939). Thomson (1940) deals with the possibly related syndrome of postpartum retinal arterial obstruction, which in some cases is associated with contralateral hemiplegia. This interesting but rather uncommon condition develops several days after delivery. The patients have usually been collapsed at the delivery, and there is presumptive evidence that the retinal lesion is the indirect result of necrosis of the pituitary.

SUMMARY

Postpartum necrosis of the anterior lobe of the pituitary is not uncommon. In four years 25 examples of the recent and healed stages of the lesion have been found in the obstetric autopsies in this hospital, and 10 of these cases are recorded in this paper. The lesion is due to collapse of the patient at delivery, usually as a result of severe obstetric hæmorrhage. A small necrosis is harmless, but if a patient with a large necrosis survives the puerperium she develops the syndrome of severe hypopituitarism subsequently. This is the ætiology of most cases of true Simmonds's disease.

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VERTEBRAL INJURIES IN CONVULSION THERAPY AND EPILEPSY

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(With Illustrations on Plate)

This investigation, carried out in February, 1940, is based on lateral radiograms of the spines of twenty mental patients recently treated by convulsion therapy and of twenty chronic epileptics. It was hoped that, if found in the epileptics, the lesions would illustrate the late results of vertebral injuries produced by convulsion therapy. Both groups were chosen from among those patients who seemed most likely to have fractures; hence no conclusions about incidence can be drawn.

FINDINGS

Patients treated by convulsion therapy.—Twenty of the last forty patients treated by this method at Cane Hill Hospital were radiographed. All were male inmates of the hospital. Their ages ranged from 23 to 55, with an average of 34. The number of induced fits ranged from 2 to 117, with an average of 22. The radiological findings are shown in table I. It is interesting that the two patients with recurrent catatonia, of whom during successive treatments one had had a total of 51 and the other 117 therapeutic fits, showed no abnormality of the spine. One of the two patients who had sustained a fractured femur in a fit showed no abnormality in the spine, and the other had slight wedging of Th. 6, of doubtful origin. All the patients who had complained of pain in the back after convulsions had vertebral fractures. The histories of the six patients with definite vertebral fractures were as follows:—

TABLE I—RADIOLOGICAL FINDINGS IN 20 PATIENTS TREATED BY CONVULSION THERAPY AND IN 20 CHRONIC EPILEPTICS

—	Convulsion therapy	Epileptics
Normal spines	11	10
Fractured vertebræ	6	1
Vertebral changes of doubtful origin	2	5
Schmorl's nodules	1	1
Osteo-arthritis	0	3
Average age	34 years	48 years

Case 1.—Male, aged 55. Height 5 ft. 6½ in.; weight 9 st. 13 lb. Pyknic type. Recurrent melancholia. Cardiazol treatment begun March 9, 1938. Given 11 fits with much improvement. During treatment he occasionally complained of pain in the back. No other symptoms of pain or disability. Finding: chip off upper anterior corner of Th. 9 (fig. I).

Case 2.—Male, aged 30. Height 5 ft. 10½ in.; weight 11 st. 9 lb. Good physique, athletic build. Paranoid schizophrenic seven years. Cardiazol treatment begun Feb. 3, 1939. Complained of backache after second, third, and fourth fits. Treatment therefore stopped. Backache ceased and has not recurred, although patient resumed work as boot-maker. Also played football and cricket as well as ever. Rounding of shoulders and upper thoracic kyphosis. Finding: wedge fracture of Th. 6 (fig. II).

Case 3.—Male, aged 23. Height 5 ft. 11 in.; weight 10 st. Good physique. Paranoid schizophrenic seven years. Triazol treatment begun July 15, 1938. Given 25 fits. No backache or other complaint. Played football and cricket as usual. Some exaggeration of already rounded shoulders. Finding: crushing and wedging of Th. 6 and, to a lesser extent, Th. 5 (fig. III).

Case 4.—Male, aged 42. Height 5 ft. 4½ in.; weight 7 st. 11 lb. Good physique. Schizophrenic seventeen years. Cardiazol begun July 4, 1939. Given 22 fits with slight improvement. No backache or other symptoms. Has since played football and cricket with no disability. Finding: crushing and wedging of Th. 6 and 7 (similar to fig. III).

Case 5.—Male, aged 45. Height 5 ft. 8 in.; weight 10 st. 10 lb. Asthenic build. Chronic schizophrenic many years. Cardiazol treatment begun Aug. 4, 1939. Given 16 fits. No symptoms. The patient has since treatment carried on his work on the coal gang which involves lifting heavy weights with no disability. Finding: flattening of Th. 6, 7, 8, and 9 (fig. IV).

Case 6.—Male, aged 40. Height 5 ft. 10½ in.; weight 10 st. 13 lb. Good physique. Schizophrenic of catatonic depressive subtype. In hospital twelve years. Given 21 fits, which made him more alert and fit for work. No symptoms. Finding: compression fracture of Th. 4 and 5. Nucleus pulposus of Th. 7 pressed into vertebral body.

In one case Schmorl's nodules were present in several vertebræ and had distinct calcified edges. Convulsion therapy had been given more than a year before the radiogram was taken, but it was thought probable that the nodules were more likely to be due to a juvenile kyphosis than to the fits.

Epileptics.—Of the forty chronic epileptics in the male epileptic ward of the hospital the twenty who had the most violent or most frequent fits were selected for radiography. Their ages ranged from 28 to 74, with an average of 48. The findings are given in table I. A definite vertebral fracture was found in one patient only. His history was as follows:—

Case 7.—Male, aged 45. Height 5 ft. 6 in.; weight 10 st. 7 lb. Good physique, thickset stocky build. Chronic epileptic. Had had major convulsions for twelve years. Had never complained of backache or other suggestive symptoms. No history of injury to spine. Does heavy work and weight-lifting with farm gang. Has obvious rounding of shoulders and upper thoracic kyphosis. Finding: crushing and wedging of Th. 5 and 6 (fig. V). Similar appearance to that in cases 3 and 4.

Of the five vertebral abnormalities of doubtful origin there were three cases of wedging of two to five consecutive vertebræ in men aged 51, 71, and 74; one man, aged 46, showed slight wedging of the five vertebræ Th. 6–10; and one man, aged 39, showed gross crushing and flattening of Th. 6–9 (fig. VI) and was known to have had an obvious kyphosis in this region for many years. In one patient Schmorl's nodules were present on most of the thoracic and lumbar vertebræ, and it was thought that they originated from an adolescent kyphosis rather than from the fits. Three patients over 60 had a slight spinal osteoarthritis. None of the patients in this group complained of pain or disablement as the result of their lesions, although eight were definitely kyphotic and nearly all had a slouching gait and round shoulders.

COMMENTS

Ætiology.—That muscular violence alone can cause these fractures has been proved in tetanus affecting otherwise healthy people. Consequently such fractures are more likely to happen in people with some abnormality of bone metabolism, as is possibly the case with some schizophrenics (Gissane et al. 1940).

Site and types of fracture.—The fractures associated with convulsions are usually found in the upper and middle thoracic regions (Th. 4–9), though they have been described as low as the first lumbar vertebra. This distribution is the reverse of that reported in crush fractures due to other forms of trauma. Four types of fracture may be recognised: (1) separation of a small fragment from the anterosuperior or the antero-inferior corner of a vertebral body (fig. I); (2) simple wedging, possibly with fragmentation of the vertebral body (fig. II) and possibly affecting several consecutive vertebræ; (3) crushing and wedging of the whole vertebral body (fig. III); and (4) gross compression with comparatively little wedging (fig. IV). Schmorl's nodules and various abnormalities of the intervertebral disks, such as prolapse, pulsion into an adjacent vertebral body, and narrowing, have also been described, but it has yet to be proved that these are due to convulsion therapy.

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Schmorl found his nodules in 38% of unselected necropsies. Kyphosis, either adolescent or senile, is often associated with these nodules and may produce slight wedging of several vertebral bodies.

Later effects.—Kyphosis is almost bound to follow fractures of the vertebræ. This may be of little consequence to most epileptics and manic depressives, but it is a serious matter in schizophrenia, in which there is a pronounced liability to tuberculosis.

TABLE II—REPORTED INCIDENCE OF VERTEBRAL FRACTURES AFTER CONVULSION THERAPY

Author	Average age (years)	Cases examined by X-rays	Cases with fractures
Polatin et al. (1939)	28·7	51	22
Bennett and Fitzpatrick (1939) ..	41·6	8	8
Palmer (1939)	†	20	5
Kraus and Viersma (1940) ..	34·5	51	5
Reed and Dancey (1940) ..	†	82	27
Blair (present series)	34·0	20	6
Total		232	73

The incidence of definite vertebral fractures in patients treated by convulsion therapy and in epileptics are set out in tables II and III respectively. It will be seen that there are striking variations in the published reports.

Symptoms.—Of my six cases of fracture in convulsion therapy four showed no immediate symptoms; the other two patients complained of backache in the interscapular region. The epileptic with signs of an old fracture had never complained of pain in the back. None of these patients had been given any treatment for their vertebral fractures, which had not previously been diagnosed; the immediate pain had been transitory, and no pain or disability had developed later. The history of the epileptic is particularly striking, because his fracture was almost certainly some years old, and he had been able to do heavy work with the farm gang without complaint. Cook, Comerford, and Sands (1940), who examined the spines of a hundred chronic epileptics radiologically, and found seven with evidence of severe compression fractures, report that all of these had been symptomless. The slightness of the disability produced by these fractures is no doubt due to their situation, for Jones (1940) has pointed out that the symptoms of fractures of the upper and middle thoracic vertebræ are much milder than those of the lower thoracic and lumbar vertebræ, which often cause persistent intractable pain.

TABLE III—REPORTED INCIDENCE OF VERTEBRAL INJURIES IN EPILEPTICS

Author	Average age (years)	Cases examined	Findings
Reed and Dancey (1940)	53·5	72	"Compression deformities" in 25 cases
Kraus and Viersma (1940)	42·4	21	1 compression fracture of Th. 11; 9 other lesions; 11 normal spines
Blair (present series)	48·0	20	1 compression fracture of Th. 5 and 6; 9 other lesions; 10 normal spines
Cook, Comerford, and Sands (1940)	†	100	16 with deformities of vertebral bodies, including 7 severe compression fractures

Treatment.—To prevent fractures a diet adequate in vitamins and calcium should be given before and during the course of convulsion therapy; the total number of fits induced should not exceed ten in the absence of obvious improvement in the patient's condition; and no more than two or three fits should be induced after reasonable improvement, according to prognostic indications (Blair 1940), has taken place. All patients who complain of backache during convulsion therapy should be radiographed, so that the proper treatment can be instituted, if only to minimise the resultant kyphosis. Where a fracture is found in the upper or midthoracic region, massage and exercises seem to be the most logical form of treatment; but in the uncommon case in which there is a fracture in the last three thoracic or in the lumbar vertebræ the object must be to correct deformity and to immobilise the fracture until it has healed. In severe cases this necessitates a plaster-of-paris jacket in extension. The minor wedgings and injuries of the intervertebral disks do not usually need more treatment than massage and exercises.

It seems reasonable to conclude that, although the various vertebral mishaps reported in convulsion therapy cannot be ignored, and all possible steps should be taken to prevent them, their effects are not sufficiently serious to justify the abandonment of a remedy which in suitable cases is superior to any other.

SUMMARY

Of six patients treated by convulsion therapy in whom vertebral fractures were found by radiography four had had no symptoms, and the other two had complained of transitory backache only. The diagnosis had not been made at the time of the fracture; hence no special treatment had been given. Of twenty patients with severe epilepsy examined radiographically one had a vertebral fracture resembling those seen in convulsion therapy, and three others had vertebral changes of doubtful origin. The patient with a fracture had had no symptoms and had done heavy farm work.

Although attempts should be made to prevent these fractures and to diagnose and treat them when they arise, it is suggested that their occurrence does not justify the abandonment of convulsion therapy.

I wish to thank Dr. G. A. Lilly, medical superintendent of Cane Hill Hospital, for permission to publish the case-records and radiograms, all of which were taken by Portable X-Rays Ltd.

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IDIOPATHIC MYALGIA

SIMULATING VISCERAL AND OTHER DISEASES

BY MICHAEL GUTSTEIN-GOOD, M.D. Berlin, L.R.C.P.E.

WE are accustomed to associate referred pain with visceral disease, such as angina pectoris and coronary thrombosis, both of which cause besides precordial pain, pain extending to the left arm and sometimes also to the right thoracic region, the jaw, and other parts. The injection, however, of hypertonic saline into a muscle produces pain in a cutaneous area which is often far away from the site of injection (Lewis 1938, Kellgren 1938). I made a similar observation about referred pain arising from a diseased muscle in muscular rheumatism (Gutstein 1938). Since the skeletal muscles constitute the largest part of the human body, contributing about 45% of the total weight (Mackenzie 1930), it is surprising that diseases of muscles are so uncommon. Apart from such rare affections as primary muscular dystrophies and myositis ossificans, textbooks of pathology hardly mention morbid conditions in the muscles. It is therefore possible that there exist affections of the muscles which are not recognised, because they produce heterotopic or referred pain. I claim that there is such a condition, which may be called "idiopathic myalgia," and can be diagnosed by objective signs.

SYMPTOMS AND SIGNS

Idiopathic myalgia is localised in the origin, insertion, belly, or edge of a muscle. It may affect one or several muscles and is characterised by the following symptoms and signs.

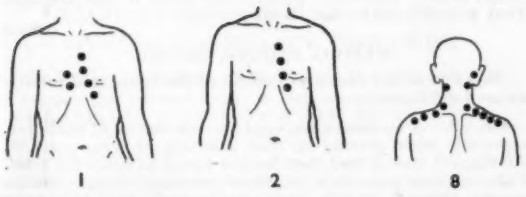

FIG. 1—Myalgic spots at origin of pectoralis major muscle on each side of sternum (case 1).
FIG. 2—Myalgic spots at origin of pectoralis major muscle on left side of sternum (case 3).
FIG. 8—Myalgic spots in both trapezoid muscles, associated with vertigo (case 9).

Pain.—This varies from a dull aching to an agonising pain and is usually ill defined. The pain comes on in spasms lasting a few minutes or longer; it is aggravated by contraction and relieved by relaxation of the affected muscle or muscles. Sometimes the pain increases during sleep to such a pitch as to awaken the patient. From observations made on myself the pain seems to consist of two kinds: a deep pain which cannot be localised and a superficial pain which can be localised, at least approximately, by the patient.

Paræsthesia.—Sometimes numbness or pins-and-needles is complained of, especially in the extremities.

Paresis.—There may be diminished or temporary loss of power in a muscle or a group of muscles.

Myalgic spots.—These are well-defined areas at the origin or the insertion, along the edge, or in the course of a muscle which as a rule are harder to the touch than are the surrounding parts. Pressure on such a spot elicits an agonising pain, which is often similar in character and extent to the spontaneous pain of which the patient complains. These myalgic spots, of which the patient is unaware, do not coincide with the painful areas complained of and in fact are often far away from them. Pressure on a myalgic spot produces an involuntary movement—e.g., jerking of the head or the shoulder—in a part of the body not pressed upon—a pathognomonic sign. If appropriate treatment is applied to the myalgic spots alone the local pain elicited by pressure and the referred pain disappear.

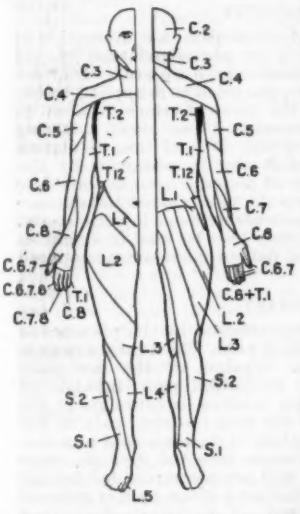

FIG. 4—Cutaneous areas innervated by the different spinal nerves (after Dejerine 1926).

MYALGIA SIMULATING HEART-DISEASE

Since pain originating in a muscle is heterotopic or referred, it may simulate disease in a viscus. A striking example is a myalgia of the pectoralis major muscle that causes precordial pain suggesting heart-disease, as in the following cases.

CASE 1.—A male dress-designer, aged 37, complained of attacks of severe cardiac pain and tightness of the chest. He was of good physique, with pulse-rate 54, pulse regular and blood-pressure 135/100. Heart not enlarged, no murmur. During examination he had an attack lasting about 2–3 min., during which the pulse-rate rose to 96, with respiratory arrhythmia. I found myalgic spots at the origin of the pectoralis major muscle on both sides of the sternum (fig. 1). The patient was given a course of radiant heat to the myalgic spots, and has since remained well.

CASE 2.—A housewife, aged 28, with three years' history of attacks of dyspnœa and cardiac pain. Slender type, pulse regular, rate 60, rising to 108 after exercise and returning to normal in a minute. Heart and blood-pressure normal. Myalgic spots were found at the origin of the sternal portion of each pectoralis major muscle. Completely relieved by physiotherapy. No recurrence since March, 1939.

Cases 1 and 2 belong to a large group of patients who consult a doctor because they fear that they have heart-disease. If the physician says something about heart sounds or heart muscle these patients are confirmed in their assumption that they are suffering from a weak heart. And if the patient is told that nothing is wrong with his heart he will take this as implying that his complaints are to a certain extent imaginary, and is likely to distrust his doctor and resort to a quack. On the other hand, it is easy to demonstrate to the patient that it is a myalgia of the pectoralis major muscle that is causing a pain referred to the heart, because pressure on the origin of the sternal part of this muscle elicits the very pain of which he complains.

This form of myalgia may also be associated with an organic disease of the heart, as in the following case of angina of effort.

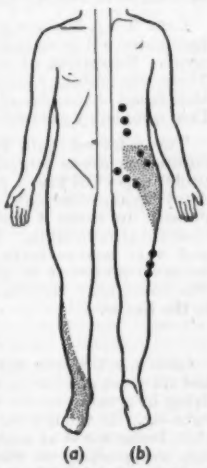

FIG. 5—Myalgic spots in quadratus lumborum, glutæus maximus, glutæus medius and tensor fasciæ latæ muscles; areas of referred pain (stippled) at back of thigh, outer aspect of leg, and great toe (case 6): (*a*) anterior view, (*b*) posterior view.

CASE 3.—A lawyer, aged 59, had had rheumatic fever some twenty-five years ago, followed by hyperpiesis and well-compensated valvular disease. In May, 1938, he complained of precordial pain and tightness of the chest, especially on walking; no dyspnœa. He was a tall man, of fair physique, pulse-rate 72–84, pulse usually regular but at times, especially under stress of excitement, with premature beats. Blood-pressure 185/100; heart enlarged, apex extending to ½ in. outside the mid-clavicular line; systolic-diastolic murmur over base of the heart and aorta; Wassermann and Kahn reactions negative; blood-urea 33 mg. per 100 c.cm. Radiography showed left ventricle moderately enlarged, aortic arch prominent, descending aorta broadened and of increased density. Myalgic spots were found at the left side of the sternum (fig. 2). Cardiac pain completely relieved by physiotherapy. Patient was kept under observation, but pain did not recur. He died in December, 1939, from acute pulmonary œdema.

LUMBAR MYALGIAS

More remarkable and surprising symptoms of referred pain may be caused by myalgias in the lumbar region.

CASE 4.—A business man, aged 47, complained of several days' severe pain in the left side of the back, radiating into the left testis and scrotum. The pain was aggravated by bending and by lying in bed; no trouble with micturition. He was a fat man with a soft abdominal wall; left kidney and ureter not tender on pressure. Urine chemically and microscopically normal. Tender spots were found at the edge of the left quadratus lumborum muscle (fig. 3). Pain relieved

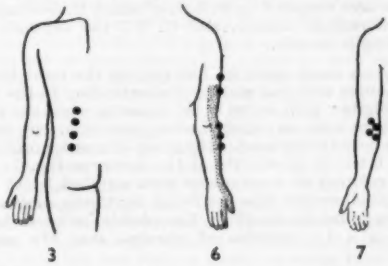

FIG. 3—Myalgic spots at edge of left quadratus lumborum muscle (case 4).
FIG. 6—Myalgic spots at origin of brachioradialis muscle and along course of extensor carpi radialis muscle; areas of referred pain (stippled) along arm to fingers (case 7).
FIG. 7—Myalgic spots over internal epicondyle (case 8).

within a week by local application of radiant heat and massage.

In this case a myalgia of the quadratus lumborum muscle caused pain referred to the testis and scrotum; these are supplied by the first lumbar nerve (fig. 4) which also helps to supply the quadratus lumborum muscle.

CASE 5.—A business man, aged 60, had had backache and pain in the left groin and inner aspect of the left knee for three years. Extraction of teeth and injections were of no avail. There was nothing abnormal in groin or knee, but tender areas were found at the edge of the left quadratus lumborum muscle. Pain completely relieved in four weeks.

The referred pain in this case was distributed over cutaneous areas supplied by L. 1 (groin), L. 3 and 4 (inner aspect of knee), and T. 12–L. 3 (lower part of back). A symptom-complex similar to or identical with that present in cases 4 and 5 is described as testicular or ilioscrotal neuralgia. It has been called "an obstinate and very severe form of neuralgia" (Wechsler 1935). In my opinion it is neither a neuralgia nor obstinate. The same may be true of some "neuralgic" conditions in the limbs.

SCIATICA

CASE 6.—A doctor, aged 46, had had right sciatica thirteen and six years ago for six and four weeks respectively. While living in a camp in the last fortnight he got sciatica in the right leg. In the last three days pain became almost unbearable, being worse at night and preventing sleep. Lasègue's sign was positive on the right side. Myalgic spots (fig. 5) were found in the lower part of the quadratus lumborum, glutæus medius, and glutæus maximus muscles, and in the lower part of the tensor fasciæ latæ muscle. Pressure on the lower edge of the quadratus lumborum muscle elicited a severe pain, which was the same in character and extent as that of which the patient complained. The pain was referred to cutaneous areas supplied by L. 1–3 (back of thigh), S. 1 (outer aspect of leg), and L. 5 (great toe). Sciatic pain completely relieved within ten days.

Sciatica is often due to an affection of muscle. The myalgic spots are usually found in the edge of the quadratus lumborum (T. 12–L. 4) in the glutæus medius (L. 4–S. 1), glutæus maximus (L. 5–S. 2), and upper and lower parts of the tensor fasciæ latæ (L. 4–S.1). The spots here described are not the same as the tender points described by Vallieux, which "are generally found at the posterior superior spine of the ilium, sciatic foramen, midway between tuberosity of ischium and great trochanter, at the neck of fibula and below the external malleolus" (Wechsler 1935).

PAIN IN THE ARM

CASE 7.—A doctor complained of severe dull pain in the right arm, especially on supination and pronation; handling a screwdriver aggravated the pain so much that work had to be stopped. There was also paræsthesia along the forearm to the thumb and index finger, consisting of numbness, pins-and-needles, and painful vibratory sensations. Myalgic spots were found at the origin of the brachioradialis muscle and along the course of the extensor carpi radialis muscle (fig. 6). Pressure on the myalgic spots elicited the same pain as that felt spontaneously. The pain was referred to a cutaneous area supplied by C. 5–7, of which C. 5–6 innervate the brachioradialis muscle, and C. 6–7 the extensor carpi radialis longus muscle. Cured.

CASE 8.—A maid, aged 29, had pain in the right forearm, with numbness and pins-and-needles extending to the fourth and fifth digits; pain worse in the morning when she started work. There were no signs of ulnar neuralgia, but myalgic spots were found at the head of the group of muscles originating from the internal epicondyle of the humerus (fig. 7). The pain was referred to a cutaneous area supplied by C. 8 and T. 1, which innervate also the flexor digitorum sublimis and flexor carpi ulnaris muscles. Completely relieved by one injection of a 1% solution of procaine into the myalgic spots.

It is interesting to note that Bazett and McGlone (1928), experimenting on themselves, found that puncture of the deep fascia or of a small blood-vessel caused pain resembling neuralgia, and that evidence of puncture of a small artery was often discovered when it was thought that a small nerve had been injured.

MYALGIA CAUSING VERTIGO

In a few of my cases a myalgia of the trapezoid muscle caused giddiness.

CASE 9.—A business man, aged 60, complained of giddiness, especially when getting up from a sitting or lying position. At times it was so bad that he was afraid to cross the road. Pulse regular, pulse-rate 84, blood-pressure 135/90. Radiography showed slightly prominent aortic arch, heart not enlarged. Ears and stomach healthy. In both trapezoid muscles tender spots were found, especially along the upper edge (fig. 8). Vertigo completely relieved within a month.

CASE 10.—A business man, aged 50, complained of headache and giddiness of several years' duration. Pulse regular, pulse-rate 72, blood-pressure 130/80, heart normal, no ear trouble. Tender myalgic spots in both trapezoid muscles. When pressure was exerted on the edge of a trapezoid muscle, the patient complained of giddiness and turned pale. Completely relieved by physiotherapy.

I made these observations on vertigo of muscular origin in 1935 and could not explain them; but Mies (1937) shows that the skeletal muscles are connected not only with the autonomic nervous system but also with the labyrinth. The trapezoid muscles in man are largely concerned in maintaining the posture of the head. For this reason they are likely to be in intimate relation to the semicircular canals.

PATHOLOGY

I suggest as a working hypothesis that the main changes in the myalgic spots are a disturbance of local circulation—a constriction of blood-vessels induced by stimulation of vasoconstrictor sympathetic fibres. This "vasomotor disequilibrium" (Leriche) would explain the pain, paræsthesia, and temporary loss of power, whatever the unknown primary cause of the vascular changes might be.

TREATMENT

For the immediate relief of the pain, a combination of codeine phosphate gr. ½–¾ or phenobarbitone gr. ½–1 with aspirin gr. 5, and phenacetin gr. 5 is useful. Radiant heat gives excellent results, provided it is applied to the myalgic spots and not to the areas of referred pain; in combination with local massage it can effect a lasting cure with great certainty within a short time (Gutstein 1940). A more rapid result can be obtained by the injection of a 1% solution of procaine into the myalgic spots; 2 c.cm. often relieves the pain almost instantaneously. I have often cured patients with one injection only. The injection of procaine may also be used in diagnosis to ascertain whether a given pain originates in a supposed myalgic spot.

SUMMARY

Idiopathic myalgia is characterised by the presence of myalgic spots causing referred pain, which may simulate visceral or other diseases. Myalgia of the pectoralis major muscles may cause precordial pain, myalgia of the lumbar or thigh muscles, sciatica or neuralgia in the testis or groin, myalgia of the arm muscles, pain in the forearm and hand and myalgia of the trapezoid muscles, vertigo. Injections of procaine into the myalgic spots may lead to a lasting cure and are recommended for use in diagnosis to ascertain whether a given pain is referred from a supposed myalgic spot.

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PSYCHIATRIC COMPLICATIONS OF HYPOGLYCÆMIA IN CHILDREN

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Hypoglycæmia, whether from overdosage of insulin or from hyperplasia or neoplasm of the islets of Langerhans, or from any other cause, shows itself most in symptoms referable to the nervous system.

Baker (1939) describes a prodromal stage of nervousness, sweating, pallor, tremor, sleepiness, and salivation, which may pass on to diplopia, muscular twitchings of the face and limbs, hemiplegia, and Jacksonian or epileptiform attacks. Other disturbances include aphasia, disorders of sensation, hemianopia or complete blindness, auditory changes, and incoördination. Finally the patient may become stuporose, with various reflex changes. Psychic disturbances sometimes accompanying the neurological signs may begin as fears, anxieties, mild depression, and faulty concentration and pass on to a stage in which the speech is thick, the patient grimaces and laughs or cries without reason, is dull or garrulous, and fugues and hallucinations may result. He may finally lose consciousness and, when he recovers, have no memory of the attack.

Other authors describe a wide range of disturbances, including a fall of tension in the eyeballs ; akinesia and mask-like stiffness of the face ; hypothermia ; migraine ; irritability ; megaphony (Wilder 1938, Stief and Tokay 1932, Harris 1935) ; behaviour disorders, such as stealing (Rud 1937, Bowen and Beck 1932) ; personality changes, with euphoric indifference and docility (Marshal et al. 1936), mild depression, severe agitation, and catatonia with grandiose delusions, besides psychoneurotic pictures (Latter and Wilbur 1937, Fenz and Kogerer 1937, Jones 1935). The association of epileptiform convulsions with hypoglycæmia, especially in children, has often been noted, but the available evidence shows that the relationship between them is not constant.

Evidence of cerebral changes has been obtained from four sources : the effects of insulin shock in diabetics ; spontaneous hypoglycæmia due to either neoplasm or over-activity of the islets of Langerhans ; hypoglycæmia following insulin-shock therapy ; and experimental hypoglycæmia in animals. The changes reported include irregular dilatation of intracerebral vessels, with sluggish flow, multiple thrombi, and perivascular extravasation, mostly in the basal ganglia and medulla, foci of blanching in the central and upper parietal region of the cortex, and interstitial œdema with swelling of the oligodendroglial cells in the white matter. Diffuse and focal glial proliferation and areas of demyelinisation have also been described in some cases (Baker 1939, Sahs and Alexander 1939, Ferraro and Jervis 1939, Jacob 1939, Hassin 1939, Yannet 1939a). The way in which these changes are produced is still uncertain. They have been ascribed variously to anoxæmia ; circulatory collapse with impairment of cerebral nutrition ; cellular starvation from lack of dextrose ; and a direct injurious action of insulin on the brain (Yannet 1939b).

CASE 1

A boy aged 13 years. The mother was deaf and looked depressed and anxious ; there was no neuropathic family history. Birth had been normal, and the boy walked, talked, teethed, and acquired clean habits at the usual ages. No history of convulsions or other illness. No neuropathic traits ; he played normally with other children and was not difficult. His intelligence, according to his parents, a local witness of good standing, and his doctor, was normal, but his school teacher described him as three or four years behind the standard for his age. This may have been due to educational retardation. There is no evidence that he was mentally defective ; at most he may have been backward.

Onset of illness.—During 1938 the boy developed symptoms of severe diabetes mellitus. He was admitted to hospital in diabetic coma, recovered consciousness under treatment, and then passed into hypoglycæmic coma. He was obviously extremely sensitive to insulin. His illness was stabilised by insulin and a suitable diet, and he was sent home, where he remained fairly well for several months. In September, 1938, he had two fits, probably hypoglycæmic. On Dec. 17 his father found sugar in the boy's urine and, without consulting the doctor, raised the insulin dosage slightly. At that time the patient was receiving 25 units in the morning and 17 in the evening. His breakfast was due at 7.30 A.M. but was not brought him until 8 A.M., when he was comatose.

He was admitted to the local hospital in hypoglycæmic coma ; his temperature was 96° F., he was sweating profusely, his pupils were dilated and not reacting, and his respiration was deep and sighing. He was treated with adrenaline, glucose, and salines, and by the evening he was able to swallow and had ceased to sweat except on the palms. Next day his temperature rose to 101° F. and continued to oscillate round this level ; the urinary sugar was high, his respiration shallow, ocular tension low, skin dry, pupils dilated and not reacting, blood-pressure 140 +, and blood-sugar 182 mg. per 100 c.cm. On the following day his condition was unchanged. Insulin 7½ units was given.

The coma persisted, and on Dec. 21 he was removed to the Royal Devon and Exeter Hospital. He was still unconscious but responded to stimuli, and his pupils reacted to light. Clonic movements took place from time to time, and there was slight rigidity of the neck. Shortly after admission he had more than one attack in which the eyes were strongly rotated to the left, and a bout of hiccuping followed. Carotinæmia caused yellow colouration of the skin. The cerebrospinal fluid was normal except for the presence of ketones ; the Wassermann reaction was negative. Radiography showed no abnormality in the skull. Blood-sugar was 186 mg. per 100 c.cm. He slowly improved and emerged from coma of at least 4 days' duration. He then showed gross dementia ; he could no longer feed himself, did not recognise his parents, was incontinent, and required nursing attention to all his needs. He was discharged on March 4, 1939, on a regimen of 120 g. of carbohydrates daily and 24 units of insulin in the morning and 16 units in the evening.

Mental state and progress.—I examined him for the first time on July 6, 1939. He was a dull lumpish heavily-built boy, fairly tall for his age, but showing no spontaneity or liveliness. It was difficult to get his attention, and his answers to questions were brief. He could not give his birthday or the date, but he knew his address. He showed a retention defect and was unable to repeat a simple story and said that 8 plus 7 made 9. He repeated five digits correctly. He recognised and named various common objects, such as a fountain pen and a key ; he described all coins as money, but he could not name a florin or a halfcrown. He showed ideomotor apraxia and constructive apraxia, being unable to imitate simple patterns with matches—e.g., asked to copy an H-shaped figure, he used four matches and made an irregular four-sided figure. There was no ideatory apraxia ; he could use common objects correctly. He failed to imitate simple sound patterns tapped on the table. His mental age by the Binet test (Stanford revision) was 5½ years. His mother said that he had improved greatly and could now wash, dress, feed himself, and go to the toilet, but was unable to fasten his trousers. No neurological abnormality was found.

By November he had improved. He knew his birthday, named a penny and a three-penny piece but not a shilling, and gave his name and address. He still could not give the day of the week, or the month, or the year. He again recognised common objects, but shown a cigarette case he said "tin," though he named the cigarettes. His movements were a little clumsy ; the constructional disability was not so gross as at his previous examination. Ideomotor apraxia persisted ; he could not perform imagined movements, such as counting out coins. He could repeat sound patterns a little better. Mental age by the Termann-Merrill test was 5 1/12 years, with an intelligence quotient of 43. His parents thought that he had improved. He could now fasten his own trousers and do simple tasks, such as feeding poultry and sawing logs. He could only write in block letters.

By February, 1940, his ideomotor apraxia had lessened further but was still present. He again failed in constructional tests but had improved a little. He could not imitate sound patterns. He wrote his name in cursive script, though imperfectly ; he could not write a simple sentence from dictation, and what he did write was illegible and meaningless. He failed to repeat a simple sentence correctly or to grasp the point of a simple comic strip, though he identified single components of the pictures. He showed some slight stereognostic failure on the right. His mother said that he could

now ride a bicycle. He filled in the outlines of drawings in a picture-book more accurately, probably as the result of two months' practice. His mental age at this time was 6½ years and his I.Q. 47. He still found it difficult to copy designs. He read a simple story at the 8-year level quite well. Asked to define words, he found difficulty in thinking of a synonym and often defined "round" the word; this might be interpreted as amnesic aphasia. He occasionally misunderstood a word, but this may have depended on dialect.

On March 9 he was examined for finger agnosia and acalculia. No acalculia was present, though his arithmetic was very bad; he could not add 5 and 4 but recognised double figures and could count dots on dominoes. He could also group matches into threes and appreciated the relative size of two objects. He failed to name his right forefinger and made one or two similar mistakes, but no true finger agnosia was present. Any failure must be attributed to the general disturbance. He greeted me with greater spontaneity than before and remembered when he had last seen me. He said that he remembered events which had taken place immediately before he went into coma.

CASE 2

A boy aged 7 years. His father only reached standard 3 at school; the mother was of poor intelligence. A paternal cousin was feeble-minded, and a sister of one of the grandfathers was in a mental hospital. The boy was the elder of two children. Delivery was normal. He weighed 9 lb. at birth and was bottle-fed. He sat up at 4½ months, cut his first tooth at 9 months, walked at 13 months, and talked at 14–15 months. His speech was always indistinct. Clean habits at 14 months. No history of previous illness or neuropathic traits.

Course of illness.—He developed diabetes mellitus at the age of 4½ years, and besides the ordinary symptoms he had severe nightmares and was somnolent ("slept all the time"). Treatment was difficult, the home environment being unfavourable and the mother having no idea of rearing children. The child was undisciplined, and feeding was irregular. During 1938 he attended school for only three weeks; he had to be excluded because of his diabetes. No residential school where he could receive treatment was available.

In September, 1936, he was admitted to the Royal Devon and Exeter Hospital with a blood-sugar of 282 mg. per 100 c.cm. After three months he was discharged, but he was admitted again a month later for another three months. His diabetes was difficult to stabilise, varying between heavy glycosuria with ketosis and hypoglycæmia. On admission he was given 50 units of insulin daily, but hypoglycæmic attacks were frequent, and the dose was reduced to 4 units every morning. If this was omitted he developed glycosuria at once.

He was not admitted again until January, 1938. He was given a diet consisting of 100 g. of carbohydrate and as much protein and fat as he liked. His condition was eventually stabilised on this diet and 24 units of protamine zinc insulin each morning. He was subject to tantrums, destructive, and difficult to control; on one occasion he killed a drake and threw it in the river, and at other times he injured children and plants. He said that he did not know what he was doing. He had several fits, according to the mother; they must have been hypoglycæmic, because he came round quickly on being given sugar. The mother mentioned spontaneously that, when his urine was more or less sugar-free, his behaviour became strange; when sugar was present, he was more normal. His frequent hypoglycæmic attacks were preceded by a feeling of hunger or cold, and when his mother brought him food she often found him unconscious.

In September, 1939, the patient stabbed another child with a knife. He was more or less sugar-free at the time. He was committed to a remand home and transferred thence to a public-assistance institution, where I saw him in October. His speech was indistinct, and his actions were inconsequent. He made restless movements with his hands and stood up in his chair. It was difficult to gain his attention, and, when he did answer questions, his replies were silly and irrelevant; he smiled mischievously from time to time. It was impossible to assess his mental age accurately, but it did not exceed 4 years. His left abdominal reflexes were brisker than the right, but there were no other abnormal neurological findings. He was sent to an institution as an imbecile under the Mental Deficiency Acts. Since admission his behaviour has improved greatly; he has become settled and easy to manage, and his intelligence has increased. At the end of November, 1939, his I.Q. was 62.

COMMENTS

Other cases of hypoglycæmia in children with neuropsychiatric complications have been reported. Wolf, Hare, and Riggs (1934) describe the case of a boy of 10 who had convulsions terminating in status epilepticus. His blood-sugar was 32–54 mg. per 100 c.cm. They found adenomata of the pancreas at autopsy and histological changes in the brain. A second patient had manic attacks associated with convulsions and coma, transient recurrent hemiplegia, pupillary changes, and confusion. The symptoms were relieved by the administration of glucose. Jennings and Rector (1937) report eleven cases of functional hypoglycæmia with convulsions in children. Two of these showed evidence of cortical atrophy, probably contributory but possibly the result of the fits; a third had cerebral œdema, thought to be secondary to a fulminating infection. Darrow (1936) reports convulsions sometimes associated with hypoglycæmia in two mentally defective children; encephalography revealed lesions of the cerebral cortex, but it is doubtful whether they were primary or secondary, and Darrow doubts whether hypoglycæmia was the cause of the convulsions. Raïhä (1936) reported the case of a diabetic girl of 13 who was given her dose of insulin after a smaller meal than usual and passed into coma some hours afterwards. She remained in coma for 4 days and then, after a restless and confused stage, regained full consciousness.

In the first of the two cases reported here hypoglycæmic coma lasted at least four days, and the patient then showed gross generalised dementia, with blurred focal signs (*Verwaschene Herdsymptome*) showing through. The symptoms suggested an extensive lesion of the left side of the brain, probably involving the parietal and frontal lobes. In view of the severe general disturbance it is difficult to interpret many of the symptoms. On emerging from the coma the child was at first on a very primitive level, did not recognise his environment, and had to relearn functions acquired at an early age; he succeeded in doing so after about fourteen months and improved in other ways also; improvement was very gradual. No return to his original level is to be expected after all this time; but, since he has progressed so far, something may result from further training. His present intellectual level is little more than half of what it was. Baker (1939) mentions the slow recovery in some of these cases and adds that such cases showing permanent functional impairment are important because they "tend to indicate the borderline in the reversibility of the cerebral changes." It can be assumed that in this patient permanent organic damage to the brain has taken place. Such cases must be rare, though possibly there are some that are not reported. This case is exceptional in that no restoration of function followed vigorous administration of carbohydrate. Many writers mention that the process is reversible, and where the change-over has not taken place the patient has usually died.

The possibility that the dementia was due to diabetic cerebral changes rather than hypoglycæmia must be considered, but the history, the previous hypoglycæmic comas, the increase of the insulin dosage together with delay in the meal, the clinical features, and the resistance to administration of sugar are typical. It was unfortunate that a blood-sugar estimation was not available at the outset, but a solitary estimation would have been of small value. The absolute level is of little importance compared with the relative level and rate of fall. I called attention to the influence of the rate of fall in the production of symptoms in a previous paper (Anderson 1935), and others have confirmed it. The necessity for correct diagnosis and prompt treatment in these cases is obvious, and this must in most cases rest upon the history and the clinical features.

Whether his previous comas had caused any cerebral damage to this particular patient is uncertain; that they paved the way to the final catastrophe is probable. In this connexion it is interesting to consider the boy's earlier intellectual level. From the available evidence it does not appear that the boy was defective in the statutory sense, but one wonders whether the teacher's observations were made after his previous comas—whether, indeed, there was an imperceptibly progressive deterioration. Possibly, too, a brain that was none too well organised tended to suffer damage more readily.

The second case illustrates a severe behaviour disorder, in which the hypoglycæmia played a decisive part. It was only one factor, however, and the case shows that an approach should be made from several directions. Although the child does not appear to have been mentally defective, it is questionable whether his intelligence was of a high level. Both parents are of poor intelligence, and there is a mentally defective cousin. It is possible that the biochemical changes excited a behaviour disorder more easily in this child than they would have done in a better endowed one. The environment was also important; the mother had insufficient intelligence or character to control the child and evidently could not regulate his insulin dosage, the difficulties of which were great. The child showed from an early age traits of unruliness, probably due partly to his upbringing. This case shows clearly the interplay of faulty nature and faulty nurture. The striking improvement in the child's condition, with a dramatic rise in his intelligence quotient as soon as he was removed to an institution, shows the effect of environment, besides illustrating the partial reversibility of his condition. Again it is doubtful whether complete restoration of function can be expected.

Young diabetics are notoriously difficult to treat. Priesel and Wagner (1932) point out that in very young children hardly any help is derived from the pancreas, and that, where stabilisation depends on exogenous insulin, attempts to make the child completely sugar-free are dangerous. The transition from treatment in an institution to treatment at home often produces serious results, because the child is more active at home and the dose of insulin required becomes less. Fits are likely to occur in young children and, when frequent, are likely to cause cerebral damage, predisposing the child to genuine epilepsy.

In the second case protamine zinc insulin was used. According to Gottlebe (1939), hypoglycæmic symptoms only arise with new "depot insulins" of this kind when the blood-sugar has reached a much lower level (30–40 mg. per 100 c.cm.) than with the old form, evidently because the gradual fall enables the body to adjust itself better. But if hypoglycæmic symptoms do appear they must be regarded much more seriously than those arising after the administration of the old insulin. Possibly the newer forms of insulin should not be used in the treatment of diabetic children unless the home conditions allow of the most rigorous control.

SUMMARY

Two cases of hypoglycæmia with neuropsychiatric symptoms in children are reported. One boy became comatose after an excessive dose of insulin and subsequently showed a generalised dementia, with symptoms suggesting an extensive lesion of the left side of the brain; after 15 months there was only partial recovery of function. Another diabetic boy, who had always been sensitive to insulin, showed a behaviour disorder most manifest when his blood-sugar was low. While in a hypoglycæmic phase he stabbed another child. After treatment he improved considerably in both intelligence and behaviour.

The literature is reviewed, including that dealing with the cerebral histological changes caused by hypoglycæmia, and mention is made of current theories of how these changes are produced.

The difficulties of treating diabetic children and the possible dangers from the use of the newer forms of insulin are discussed.

I wish to thank Dr. F. Roper, physician to the Royal Devon and Exeter Hospital, for details of both cases and for giving me access to the clinical records; Dr. A. V. Hamilton, of Tiverton, for information about the first case; and Dr. Enid Davies, acting psychiatrist to Devon county council, for her help.

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Reviews of Books

Manual of Cardiology

By W. D. REID, M.D., F.A.C.P., assistant professor of medicine, Boston University school of medicine. London: Humphrey Milford, Oxford University Press. Pp. 364. 18*s*.

THIS book, obviously inspired by the teaching of Mackenzie, is an attempt to convey the essentials of cardiology by means of case-records. The greater part of it consists of 56 such records and a discussion of their significance; in addition there is a section on clinical methods in which the diagnosis, prognosis, treatment, and prevention of heart disease are considered in a pleasantly discursive manner. No attempt is made to cover the whole ground of cardiology; it has rather been the author's intention to impress on the reader some of the more important problems which he is liable to meet. The teaching, based on long personal experience, is on the whole eminently sound, but to appreciate it the reader must have an elementary knowledge of cardiology. Naturally it is not intended to replace teaching at the bedside, but it is likely to be valuable to the newly qualified about to embark on hospital or private practice as a manual not only of cardiology but of the principles of the practice of medicine.

Annual Review of Physiology

(Vol. II.) By JAMES MURRAY LUCK, editor, and VICTOR E. HALL, associate editor. London: H. K. Lewis. Pp. 501. 27*s*. 6*d*.

EACH chapter in this series (which is published under the auspices of the American Physiological Society) forms a link of a chain whose integrity becomes yearly more important. Some of this year's links lack design and craftsmanship, and while keeping their chain intact are of little more use than a card index. To try to prescribe for the perfect annual review would be foolish, but it can be said that to make a mosaic of the year's abstracts is to waste skill. Excellent abstract journals already exist; and it is therefore permissible and preferable to select lines of advance and deal with them helpfully. Many authors have done this, and Mossman on developmental physiology, Fulton on the nervous system, and Thomson and Collip on endocrines typify three ways in which a review can be made interesting and adequate. On the whole, the reviews collected here are sound, and the worst criticism that can be made of them is that a number lack imagination in treatment and do not attract comparative strangers to their subjects.

Edelmann's Textbook of Meat Hygiene

(7th ed.) By JOHN R. MOHLER and ADOLPH EICHHORN. London: J. and A. Churchill. Pp. 463. 30*s*.

THIS famous American textbook of German origin has been modernised as regards American law and administration; descriptions of recent American methods and equipment have taken the place of the older German processes; an entirely new chapter on the ductless glands has been added; and we are now given the latest views on the pathology and judgment of meats. It will not serve as a textbook for British students because the laws, methods of administration and trade customs and processes it describes are those of the United States, but it will be a useful book of reference for veterinary surgeons and specialists in food inspection practising in our own country. It still retains evidence of its German origin, especially in its advocacy of freibanks,

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which do not exist in America, and the descriptions of pathological conditions and their bearing on condemnation. Chapters of particular excellence are those on morphology and chemistry, on putrefactive changes, and on infestation of meats by saprophytic plants and animals. The book appears at an opportune time, for just now meat is often inferior in condition and finish but it is also scarce and as much of it as possible must be passed for consumption, though the rejection of all which is dangerous to health or unwholesome must be as rigid as ever.

Circulatory Diseases of the Extremities

By JOHN HOMANS, M.D., clinical professor of surgery, Harvard Medical School. London: Macmillan and Co. Pp. 330. 24*s*.

THIS book is the product of a life-long interest in the clinical problems presented by disorders of the circulation, and it is largely for this reason that Dr. Homans has been able to give such a masterly summary of present-day opinion on many of the complex and still unsolved mysteries of vascular disease. The book gives evidence, however, of much more than a mere interest in its subject, for based on well-authenticated historical foundations it presents the balanced judgment of a clinician whose standards of physical examination and therapeutic technique are of a high order, and one who weighs carefully the results of his own experience against the dictates of anatomical and physiological theory, and also against the recorded experience of other workers in the same field. Every chapter provokes thought and a desire for further study which may be satisfied by reference to the bibliography at its end.

Dr. Homans distinguishes clearly between arteriosclerotic deficiency with thrombosis and thromboangitis obliterans, and there is a chapter on arterial spasm and embolism which covers many conditions which are commonly neglected in textbooks. The sections dealing with varicose veins and lymphatic obstruction are some of the best in an excellent and well-illustrated book.

Notter and Firth's Hygiene

(10th ed.) Revised by L. C. ADAM, M.B., and E. J. BOOME, M.B., M.R.C.P. London: Longmans, Green and Co. Pp. 518. 12*s*. 6*d*.

THIS edition includes a considerable amount of new matter. The chapter on sanitary law wisely makes no attempt to deal with the subject in detail, but sets out the more important points clearly and concisely. The chapters on school hygiene, ventilation, and water and sewage disposal are interesting to read and informative; such pertinent matters as mental deficiency, speech and its defects, the welfare of the blind, dental hygiene, and camp sanitation are discussed at length; the views expressed on child development are somewhat dogmatic, but the inexperienced will find them useful. It is impossible to deal fully with all branches of public health, but more space might have been given to the problem of safe milk, and in the light of modern knowledge of nutrition less emphasis might have been laid on the calorie value and more on protective foods and their relationship to growth and disease. No mention is made of diphtheria immunisation or of school meals, and more reference to other works might have been given with advantage. Students of public health and welfare workers at all stages will find the book useful, but it is rather too elementary for the practising public-health officer.

Précis d'oto-rhino-laryngologie

(2nd ed.) By GEORGES LAURENS, MAURICE AUBRY and ANDRÉ LEMARIEY. Paris: Masson et Cie. Pp. 1241. $3.30.

THOUGH it is called a précis this is not a small book, but every section is so full that it remains a miracle of compression. The French language can be intensely expressive in short, condensed sentences, and the authors have demonstrated their mastery of this art of writing. Nothing is scamped, although detailed descriptions of operative technique are omitted. Stress is laid on the pathology and the clinical course of disease processes. No bibliography is provided but the names of workers in every special field are mentioned in the text. It is perhaps remarkable that neither zinc ionisation nor iodine and boric acid powder are mentioned in the treatment of chronic middle-ear suppuration, in spite of the proved value of both methods. There is a brief account of petrositis in which Ramadier's teaching is closely followed; the authors even prefer his method of anterior drainage through the carotid canal—a more hazardous approach than Eagleton's, which is condemned. The section on the physiology and pathology of the inner ear is excellent; the labyrinth and its diseases are especially well described, and the value of sulphanilamide therapy in meningitis is emphasised. The chapters on the nose and nasal sinuses are also extremely good; the broad physiological principles of treatment are brought out, though here again there are certain omissions—for instance the use of ionisation in hay-fever, and the Proetz suction-displacement treatment of chronic sinusitis which has been very successful in America and England, and which is especially suitable for children. However, there are apparently several differences in the normal procedures in France and Britain; guillotine tonsillectomy under ethyl chloride, for example, is advised as a routine for children. There is an interesting account of nasopharyngeal tumours and a good description of the pathology and natural history of other tumours of the pharynx. Tuberculosis of the upper respiratory tract is dealt with excellently, as is usual in French textbooks; it is illustrated more freely than the other sections with particularly clear black-and-white diagrams. The difficult subject of laryngeal palsies is so easily and briefly described that it is at first difficult to believe that the authors have not falsely simplified it, but even the most passionately accurate reader could find nothing here to criticise. Cardiospasm is discussed without mention of Hurst's theory of achalasia or of his method of treatment with mercury bougies, which is simple and on the whole successful. These minor blemishes do not detract from the real pleasure of reading the book.

Dental Anatomy for Students

By JAMES AITCHISON, H.D.D., L.D.S. Glasg., lecturer and assistant visiting dental surgeon to the Glasgow Dental Hospital. London: John Bale, Sons and Staples. Pp. 272. 12*s*. 6*d*.

ONLY an experienced teacher knows how important it is to enliven a purely academic subject with examples which have a practical application. This book, which the author modestly calls a compilation of notes, not only includes all that the average dental student ought to know about dental anatomy but presents it in an assimilable form. The section on comparative dental anatomy occupies only the last third of the book and is more succinct and attractive than such accounts generally are. The earlier part deals with embryology and anatomy at welcome length and with a full-charged brevity of style. The illustrations and diagrams are adequate and often refreshingly new.

The Diabetic A B C

A Practical Book for Patients and Nurses. (7th ed.) By R. D. LAWRENCE, M.D. London: H. K. Lewis and Co. Pp. 64. 3*s*. 6*d*.

THE changes made in this popular primer are slight. Mention is made in the line-ration scheme for the first time that 7 oz. of milk contains, in addition to 10 g. of carbohydrate, protein and fat in amounts equivalent to a red portion. Diabetic rationing problems are often solved by a full appreciation of this fact. Miss Pearce has added a few new recipes, and vitamins now receive attention in the rules of health. The reference to Danish retard insulin is unnecessary in a war-time edition. The continued inference in the book that the majority of diabetics in this country have evening dinner is not in keeping with either British custom or modern practice in hospital clinics. The wisdom of including Rothera's test in a simple handbook is doubtful; the space might have been better utilised by a description of some of the difficulties experienced in the testing for urinary sugar, more advice on the avoidance of sepsis and more information relating to rules of general health. British diabetics, lacking the plethora of popular literature available in America, will remain permanently indebted to Dr. Lawrence for providing such a readable, sound and practical book.

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THE LANCET

LONDON: SATURDAY, SEPTEMBER 14, 1940

HORMONE TREATMENT OF UNDESCENDED TESTIS

AFTER an initial period of excessive optimism the treatment of imperfect descent of the testis with gonadotrophin seems to be regarded now with increasing and perhaps unwarranted pessimism. A difficulty of assessing any method of treatment for this condition has been the lack of sound statistics. We do not know the exact incidence of maldescent of the testis in boys or the outcome when left to nature, because clinicians are agreed neither upon a standard definition of the term undescended testis nor upon what is a cure. Until these obstacles have been overcome, the results claimed by observers using different therapeutic methods cannot be faithfully compared or indeed regarded as scientific data. Experimental biology has provided a good foundation for hormone therapy. Unfortunately the evidence available from this source is not complete, because it is among the primates alone that the testes descend into the scrotum before birth and remain there. In other orders the testes come down only at puberty or in the rutting season, and in such animals testicular descent may be induced by gonadotrophin before the normal age of puberty and in the non-breeding season. In the macaque the testes are already in the scrotum at birth, after which they recede into the abdomen and stay there until puberty when they descend permanently. Premature descent may be induced in this monkey by gonadotrophin.[1] These and many other experimental observations on animals have shown that gonadotrophin plays a leading part in the natural descent of the testes.

Let us consider some of the objections which have been made against applying this knowledge in the field of human therapy. The objectors differ both in their reasons and in their recommendations of alternative measures. Among 31,609 boys ranging up to seventeen years of age JOHNSON [2] found 544 examples of undescended testis. In 517 of these who received no treatment the testes eventually reached their normal position in the scrotum in 300, a spontaneous recovery-rate of 58%. On the other hand in 42 boys subjected to operation a good result was obtained in 12 only, or 28·5%. JOHNSON concludes that the results of orchidopexy are extremely discouraging. Endocrine treatment is, he thinks, permissible as an adjunct to nature but is unnecessary, the best therapy being to leave things to nature until the boy is at least sixteen years old. In contrast with JOHNSON'S views are those of EISENSTAEDT, APPEL and FRAENKEL [3] who state that gonadotrophin may damage testes which have not reached the scrotum, that an operation is not facilitated by a previous course of endocrine treatment but is rendered more difficult thereby through the formation of adhesions, and that in true cases of undescended testis operation is always required. As to the desirability of operative treatment these are opposite views, but the respective writers agree in discarding hormone treatment, one because it is unnecessary and the others because it is harmful. There are several possible complications which may demand surgical relief without much question, for example torsion of the mesorchium, hernia, repeated trauma or persistent pain. In addition ectopia testis has to be considered as distinct from incomplete descent, and little is to be said for treating ectopia otherwise than by surgery. Apart from such definite indications operative treatment, it seems, should be a last resource to be postponed until puberty has become well established and the hope of a cure by other means has been abandoned.

Apart from the claim that it is useless and unnecessary, disadvantages may undoubtedly result from the use of gonadotrophin, especially if it is administered too abundantly or to very young children in whom it is apt to cause enlargement of the penis and scrotum [4] with undesirable evidences of premature puberty and sex-consciousness. In the light of these possibilities some will prefer to delay giving gonadotrophin until the age of puberty has already arrived; and within such limitations it is hard to see what harm could be done by well-regulated hormone therapy even if no benefit followed. The statement made by EISENSTAEDT and his colleagues that gonadotrophin may cause actual damage to the testis and adjacent structures must of course be borne in mind, though it appears to be unsupported by, and indeed contrary to, laboratory experience, and based only on uncontrolled clinical observations—a dangerous foundation for scientific argument. SPENCE and SCOWEN [5 6] deny that there is any evidence that continued therapeutic administration of gonadotrophic hormone from a human source produces degenerative changes in the human testis. Against hormone therapy it has been urged that a failure of the testis to descend is commonly attributable to some anatomical defect which gonadotrophin cannot remove. Such anatomical hindrances there may be, but unless we can detect them with certainty and determine that they are the sole impediments, and that they cannot be overcome by gonadotrophin, there seems little justification for regarding their hypothetical presence in any particular case as a reason for refraining from a trial of gonadotrophin. Even if the hormonal treatment be ineffective it will cause enlargement of the spermatic cord, testis and associated structures including the scrotum, a fact which is thought by some to facilitate surgical procedures if these become necessary.

In general there seems to be one indisputable indication for the therapeutic use of endocrines: to replace an existing deficiency. Gonadotrophin is undoubtedly valuable in the treatment of undescended testis in cases of hypogonadism, whether accompanied by major and more general signs or merely by slight indications such an underdevelopment of the penis and scrotum. Future experience reported in scientifically defined terms will teach us its precise value in cases where signs of hypogonadism are less obvious or absent.

1. Engle, E. T. *Endocrinology*, 1932, **16**, 513.
2. Johnson, W. W. *J. Amer. med. Ass.* 1939, **113**, 25.
3. Eisenstaedt, J. S., Appel, M. and Fraenkel, M. *Ibid*, July 20, 1940, p. 200.
4. Mimpriss, T. W. *Lancet*, 1937, **1**, 497.
5. Spence, A. W. and Scowen, E. F. *Ibid*, 1938, **2**, 983.
6. Spence and Scowen, *Brit. med. J.* 1939, **1**, 693.

RISKS OF CAROTID LIGATURE

CAROTID ligature has a reputation as a dangerous operation likely to be followed by serious interference with neural function or even death, but SCHORSTEIN [1] has analysed 60 cases in which it was done for saccular-intracranial aneurysms and he concludes that the one important cause of neural damage after ligature is preoperative impairment of the cerebral circulation; if this is absent the operation has little risk. In 22 cases of ligature for infraclinoid aneurysm there were no deaths and only 3 patients developed signs of neural damage; in 2 of these the ligature was done to control hæmorrhage threatening life, and in the third the aneurysm was large and probably interfered with the development of an efficient collateral circulation. He divides supraclinoid aneurysms into two groups—those with, and those without, leakage. Of 12 with leakage, 9 had bled a short time before ligature, and of these 5 died and 3 had transient signs of neural damage. Of 22 without leakage 3 died and 2 had transient signs of neural damage; of the 3 fatal cases 2 were believed to have died of compression of the middle cerebral artery by the aneurysm and the death of the third was not satisfactorily explained. It appears from these figures that ligature may safely be performed for infraclinoid aneurysms, but that it is dangerous for supraclinoid aneurysms, especially if there is extensive subarachnoid hæmorrhage.

SCHORSTEIN dismisses embolism as a cause of neural damage after ligature because, in his experience, ligature of the common carotid—though usually reserved for desperate cases—is safer than ligature of the internal carotid; yet supporters of the embolic theory usually argue that the reverse stream from the external carotid sweeps clot into the internal carotid—an accident which could not follow ligature of the internal carotid. He also points out how rarely clot is found in the cerebral vessels post mortem and gives a detailed account of the histology of the brain in a fatal case in which no evidence of emboli was found. Carotid ligature for conditions other than aneurysm, he points out, is usually indicated in cases in which the blood-pressure is already seriously affected and the efficiency of the collateral circulation impaired. SCHORSTEIN'S conclusions are supported by two other papers on carotid ligature for extracranial conditions. BERARD and DARGENT [2] analysed 10 cases of ligature for cancer in the neck, of which 3 were fatal; 2 of the deaths were possibly due to cerebral damage though none had hemiplegia before death. Of the surviving 7, 1 had a period of apnœa after ligature but rapidly recovered, 1 had transient loss of consciousness and another developed hemiparesis on the day after ligature. They attach importance to the vasoconstrictor reflexes that may be set up by the ligature and advise the administration of vasodilator and antispasmodic drugs. They consider that arteriectomy and venous ligature may also be necessary in this type of case and may prove useful in preventing neural damage. The risks of ligature are greatly increased if hæmorrhage has occurred, but on the whole they conclude that the operation is not very dangerous. In contrast to these encouraging results are those of SILVERSTONE and WATSON [3] who described ligature in 20 cases, mostly of neck cancers. Many of them were desperate and ligature was undertaken to prevent or control hæmorrhage from the carotid vessels. About half the cases developed signs of neural damage and 11 died during, or shortly after, operation; in some neural damage was apparently the cause of death. Though these authors are impressed by the dangers of carotid ligature their observations—illustrating as they do the risks of ligature in the presence of hæmorrhage and sepsis and during big operations—are really in accord with those of BERARD and DARGENT. They note that excision of the vessels, so often necessary in cancer operations, is attended by better results than simple ligature, but they do not attach the same significance to it as BERARD and DARGENT. Both papers bear out SCHORSTEIN'S contention that previous impairment of the cerebral circulation is the crux of the matter. Many factors may lead to this impairment. Where the lesion lies outside the cranium such factors include sepsis, hæmorrhage, and the necessity for a big operation, whereas lesions inside the cranium may cause an increase of tension and vascular compression.

1. Schorstein, J. *Brit. J. Surg.* 1940, **28**, 50.
2. Berard, M. and Dargent, M. *J. chir.* 1939, **54**, 197.
3. Silverstone, S. M. and Watson, W. L. *Ann. Surg.* 1939, **109**, 1.

FIRST-AID FOR ASPHYXIA IN AIR-RAIDS

IN our issue of Aug. 24 (p. 235) we drew attention to a possible danger in the use of the Schafer method of artificial respiration for air-raid casualties whose lungs have been bruised as a result of blast, and first-aid workers are naturally seeking further guidance on this question. According to the most recent Ministry of Home Security handbook "common causes of asphyxia under air-raid conditions include: electrocution; continued pressure on the chest or obstruction of the upper breathing passages, for example, by debris; confinement in a poisoned atmosphere (for instance, in an enclosed space containing domestic coal gas, exhaust fumes, or after-damp); and drowning." To this list must now be added asphyxia or respiratory embarrassment due to bruising the lungs by blast. Blast, of course, might be associated with any of the other circumstances which predispose to asphyxia. Almost any of them too might be associated with a penetrating wound of the chest which, unless looked for, might go unrecognised. Except where such a wound is present, or where there are clear signs, in the appearance of blood in the mouth and nasal passages, that the lungs have been damaged by blast, first-aid workers should apply a manual method of artificial respiration in dealing with all cases of obvious asphyxia. Artificial respiration should not be used, however, for simple respiratory distress, but only when breathing has ceased. So far as penetrating wounds are concerned, it must be remembered that these wounds can be very small, and before a manual method of artificial respiration is begun a very rapid examination should be made of the front and back of the chest of casualties who show signs of asphyxia after having been in the vicinity of a bomb explosion, but thereafter there must be no further delay. Mechanical methods of artificial respiration cannot be made available for first-aid parties, and as the recent Medical Research Council report on breathing machines points out, anything which decreases enthusiasm for manual methods cannot but do harm.

There will be little difficulty in recognising most cases in which manual methods are themselves likely to be injurious, for when the lungs have been seriously bruised by the impact of the blast wave on the chest wall blood-stained froth is likely to be found in the mouth and nose. Difficulty does arise in recognising slighter blast injuries to the lungs, and occasional severe injuries in which no blood-stained froth is present, but these marginal cases are rare and the best advice is to ignore them and start artificial respiration by a manual method immediately. Moreover, serious blast injuries to the lungs will probably not occur in the open further than 50 feet from a 500 lb. bomb, since the pressure set up by its detonation at that distance is no more than 6 lb. per square inch.[1] The distance would be greater in a confined space. No information is yet available about the incidence of asphyxia in air-raids, or of respiratory embarrassment due to blast, but it is to be expected that the latter group will constitute only a small part of the total cases of asphyxia. While it is advisable, therefore, to keep an urgent look-out for these cases the first line of defence in the treatment of asphyxia must continue to be a manual method of artificial respiration. Where blast bruising of the lungs is recognised this method should not be used and such casualties should be referred as quickly as possible to a hospital.

PITUITARY NECROSIS AFTER CHILDBIRTH

In 1914 MORRIS SIMMONDS [2] of Hamburg described the disease which has since borne his name, characterised by cachexia, mental disturbance, amenorrhœa and genital atrophy, loss of teeth and hair, and a low basal metabolic rate. He related the condition to atrophy of the anterior lobe of the pituitary, and suggested that this was connected with parturition and was due to embolism or thrombosis. The syndrome may, in fact, develop in men, though it is mainly seen in women and especially those with several children. The complete picture is rare and invariably fatal, but a good many examples of milder forms have been recorded. In the last few years SHEEHAN [3] has emphasised that the essential pathological change preceding the syndrome is some gross destructive lesion in the anterior pituitary, and that emaciation should not be considered the fundamental symptom, since in many otherwise typical cases nutrition is normal. In his view if there is loss of weight it is usually due to a reduced intake of food, and there is little evidence that the pituitary lesion is directly responsible. GRACE NICOLLE,[4] however, says that loss of weight may precede lack of alimentation. SHEEHAN has found that in few of the cases reported as Simmonds's disease in recent years has there been anything to suggest an organic lesion in the pituitary, and he agrees with RYLE, SHELDON and SPENCE [5] that most of these are examples of anorexia nervosa. Opinion will probably be divided whether we should restrict the term Simmonds's disease to cases with a pituitary lesion and the clinical features originally described, or should include all cases with clinical evidence of hypopituitarism associated with a destructive lesion of the anterior lobe.

For many years instances of hypopituitarism developing after pregnancy were ascribed to embolism, and later to "exhaustion" of the anterior lobe, but the position has now been clarified by SHEEHAN'S observations. He [6] has shown that in women who have a severe collapse at delivery and die during the puerperium there may be extensive necrosis of the anterior pituitary, which appears to be due to thrombosis of the vessels. His analysis of published autopsy reports of patients with Simmonds's disease dating from parturition some years earlier revealed that they had old necrotic lesions in the anterior lobe which were easily distinguishable from the atrophy and fibrosis found in cases unconnected with pregnancy. In collaboration with ROBIN MURDOCH [7] he later produced convincing evidence that if the patient survives a collapse at delivery she may subsequently develop manifestations of pituitary insufficiency. The severity of these disturbances bears a definite relation to the severity of the collapse, and they may involve almost any system of the body. During the first few weeks after delivery they are, as a rule, overshadowed by the patient's obstetrical condition. In severe cases there is usually complete absence of mammary activity during the puerperium; there may be hyperinvolution of the uterus and genital atrophy resulting in sterility, with loss of the axillary and pubic hair, asthenia, psychological changes and anæmia. Later the patient may look myxœdematous or prematurely senile. In the majority of cases the weight is unaltered, but exceptional loss of appetite leads to emaciation and death. In milder cases there may be various menstrual disturbances, thinning of the hair, debility, anæmia, hypersensitivity to cold, and mild changes in character, such as listlessness, loss of initiative and forgetfulness. SHEEHAN and MURDOCH [8] have also demonstrated that in patients who have had a postpartum necrosis a subsequent pregnancy is possible if genital atrophy has not taken place, and that if there is no further collapse at delivery a subsequent pregnancy or even miscarriage greatly improves or completely cures the symptoms of pituitary insufficiency. They suggest that the part of the pituitary which escaped the necrosis undergoes the normal physiological hypertrophy during the second pregnancy and does not return to its previous size after delivery. The rational treatment of this condition is therefore to encourage another pregnancy, and if genital atrophy is present the administration of sex hormones may make this possible.[9] The greatest care must of course be taken to avoid a repetition of the collapse, which in most cases follows a severe hæmorrhage but may be produced by other complications, and before delivery begins arrangements must be made for immediate blood-transfusion.

In this issue Dr. SHEEHAN records further cases which substantiate his previous conclusions. His work has advanced our knowledge not only of Simmonds's disease and certain forms of hypopituitarism but also of the causation of symptoms which have long been known to arise after complicated deliveries.

1. "Structural Defence." A.R.P. Handbook No. 5.
2. Simmonds, M. *Disch. med. Wschr.* 1914, **40**, 322; 1918, **44**, 852.
3. Sheehan, H. L. *Quart. J. Med.* 1939, **8**, 277.
4. See *Lancet*, 1938, **2**, 1173.
5. Ryle, J. A., Sheldon, J. H. and Spence, A. W. *Proc. R. Soc. Med.* 1939, **32**, 735.
6. *J. Path. Bact.* 1937, **45**, 189.
7. *J. Obstet. Gynec.* 1938, **45**, 456.
8. *Lancet*, 1938, **2**, 132.
9. *Ibid*, 1939, **1**, 818.

Annotations

SIR J. J. THOMSON, O.M.

A GREAT epoch in the history of physics came to an end on Aug. 30 with the death of Sir Joseph Thomson, one time Cavendish professor at Cambridge and known to the scientific world as "J.J." For so long has he stood to British minds as the supreme genius in physics that his passing will be felt as a national loss. At the age of 27 he was elected unanimously to the chair vacated by Lord Rayleigh, who took over on the death of Clerk Maxwell —one giant succeeding another—and "J.J." in the fulness of years gave place to Rutherford, who, had there been no Gallipoli, would doubtless have been followed by Moseley. The name of Thomson will always be associated with the discovery of electrons, negative corpuscles as he termed them, small bodies indeed in comparison with the massiveness of the lightest atom. He wrote an exciting chapter of science in 1897–98 when he tied the labels of velocity, charge and mass (v, e and m) to the electron; for many years after this he was supreme in identifying high-speed particles—in fact, once they got up speed he could with his device of crossed electric and magnetic fields in vacuo do just what he wanted with them. His projection of their parabolic orbits revealed the isotopic character of many gases and a new chapter in atomic-weight determinations was written by his staff at the Cavendish. Thomson's books were few, but highly valued; he was joint author with Poynting of a classic entitled "Properties of Matter" and others in the same series; but the book for which he was known the world over was "The Conduction of Electricity through Gases" which remained the standard treatise in English for many years. He was always an attractive lecturer and no-one who listened to him could fail to notice the wide sweep of his imagination. In later years "J.J." turned this brilliant imagination to the problem of light. As he pointed out, Newton was partly right in his corpuscular theory, and Huygens was partly right with his wave theory, while Clerk Maxwell was certainly not wrong in claiming that all radiation has some electromagnetic character. It was Thomson's task to weld these theories together and illuminate the wave front with a structure which was entirely novel.

INSULIN AND CEREBRAL DAMAGE

IN this issue (p. 329) E. W. Anderson has reported permanent mental changes which resulted from prolonged hypoglycæmic coma in two children. Both patients were diabetics under treatment, and the first was in hypoglycæmic coma for four days while the second had repeated transient attacks of hypoglycæmia with convulsions. Very gross mental deterioration was evident on recovery from coma, and although it slowly improved a permanent residual defect persisted in both cases. Klein and Ligterink [1] have just reported a very similar condition in two adults who as a result of hypoglycæmia so deteriorated that in one all signs of rational thinking, higher feeling and reasoned action were absent, the level finally reached by the patient being complete idiocy. The complications of prolonged hypoglycæmia have become increasingly common since the use of insulin shock therapy in schizophrenia. It seems that well-controlled and short-lived hypoglycæmia will produce cerebral changes which are easily reversible, but there is a critical limit to the glucose deprivation which the cerebral neurone can tolerate. Many excellent pathological reports of the resulting conditions are now available (Baker,[2] Sahs and Alexander,[3] and they all describe vascular thrombosis, neuronophagia, and in non-fatal cases glial overgrowth—changes similar to those seen after prolonged cerebral anoxæmia. Different workers have ascribed the damage to simple cellular anoxæmia, circulatory collapse with consequent impairment of cerebral nutrition, cellular starvation from lack of glucose alone, and to the direct toxic effect of a large concentration of insulin in the cerebral blood. Yannet [4] recently concluded that deprivation of dextrose and the deleterious effect of a high level of insulin in the blood were together responsible for the changes. The clinical and pathological picture is similar to that seen in experimental hypoglycæmia in animals. During the period of low blood-sugar myoclonic movements and convulsions may occur, as well as diverse scattered signs of local cerebral damage, and later mental impairment may be associated with such local signs as aphasia, apraxia, hemiplegia, or Jacksonian epilepsy. The symptoms remind us that caution is imperative in the administration of the different types of insulin to unstable diabetics; and that the therapeutic use of hypoglycæmia in the psychoses should be increasingly circumspect.

1. Klein, F. and Ligterink, J. A. *Arch. intern. Med.* 1940, **65**, 1085.
2. Baker, A. B. *Amer. J. Psychiat.* 1939, **96**, 109.
3. Sahs, A. L. and Alexander, L. *Arch. Neurol. Psychiat.* 1939, **42**, 286.

GENETICS AND EMBRYOLOGY

THE concept of the gene arose from combining the study of heredity with that of the structure and behaviour of the chromosomes. This fruitful combination of the sciences of genetics and cytology, at first sight unrelated, was accomplished by Morgan and his school and is one of the outstanding achievements of modern biology. It is natural that biologists should seek further opportunities for synthesising their subject matter, the subdivisions of which have so few common basic principles and are often expressed in languages of their own. Modern genetics is concerned with genes, the existence of which was deduced from the study of chromosome behaviour and from their final expression in the developed organism. An important link, or series of links, is lacking. What is the chain of causally determined events by which a particular gene, or combination of genes, gives rise to the characteristics for which it is responsible? Clearly the subject matter of experimental embryology—the study of the causal factors in development—must somehow be brought into contact with that of genetics. Mr. C. H. Waddington, Sc.D., an experimental embryologist with an extensive knowledge of genetics, is one of the few who are well qualified to discuss the work which has been done in this recently developed field. His book, "Organisers and Genes" (Cambridge University Press, 1940, pp. 158, 12*s*. 6*d*.), is primarily a discussion of the fundamental concepts of experimental embryology and an attempt to relate these with what is known about the nature of the gene. When we consider certain genes whose action is well defined—in that they are responsible for the production of definite substances or control growth-rate, or the rate of known chemical reactions—we are tempted to hope that all developmental phenomena may some day be explained as the sum of a series of reaction chains initiated by the original genes in the fertilised egg. But we are immediately brought up against the fundamental biological problem of organisation. It is not enough to explain how each gene individually gives rise to a certain character: we must also know how the individual characters are organised into a pattern. To embryologists this has always been the main problem, which has not been solved by Spemann's discovery of the "organiser" phenomenon. But until lately geneticists have been able to work on a purely particulate theory of inheritance by which the genes were supposed to act as independent units. It is now known that the action of a gene depends both on the nature of the rest of the gene-complex and on its relative position in the chromosome with respect to other genes. The gene-complex in the nucleus is, in fact, an organised

4. Yannet, H. *Ibid*, 1939, **42**, 395.

pattern. Dr. Waddington, in discussing the problem of organisation, offers little hope of solution, but gives a good idea of the way in which biologists are trying to solve it.

SULPHAPYRIDINE AND LUNG ABSCESS

IT is now generally accepted that the presence of pus, whether in the pleural space or within the lung, greatly inhibits the action of M. & B. 693. In a report from Lahore on another page, Prof. Taylor and others show that in 3 out of 7 cases of lung abscess dramatic improvement followed sulphapyridine therapy, 2 of them losing fever of several weeks duration within twenty-four hours. Should further investigation support the evidence of this small group of cases it will be difficult to account for the discrepancy between Indian results and those obtained in temperate regions. Fisher and Finney [1] reporting on 88 cases of lung abscess treated in Baltimore between 1931 and 1938 mention one due to β-hæmolytic streptococci which seemed to be benefited by sulphanilamide; they recommend that sulphapyridine should be used early when an abscess directly follows a pneumococcus pneumonia, but doubt whether the drug will have any effect on an abscess once it is fully developed. Pneumococcal pneumonia is prevalent in the Punjab, and the relatively susceptible pneumococcus may be more commonly responsible for lung abscess there than the anaerobes and other organisms associated with dental sepsis which are so often incriminated in England.

DOES THE CURRICULUM STIFLE RESEARCH?

IN a thoughtful address Dr. A. E. Cohn of the Rockefeller institute for medical research in New York [2] has approached the debatable subject of the faults of the present curriculum. He inquires whether it would not be possible to adjust the approach to scientific research without adhering rigidly to the standards of knowledge of disease now exacted of medical graduates. His own view of the solution of the problem is not wholly clear for he is more concerned to state the difficulties than to prescribe the remedies. The main difficulty as he sees it is that the present curriculum is so long that the would-be researcher only begins to undertake responsible research work at an age when he is already losing something of the freshness and ardour of the explorer; and he suggests somewhat tentatively that it might be possible so to arrange things that the student who knows early in his career that he wishes to devote himself to scientific research would be able to specialise, and so enter on his life's work at an earlier age. It is a plea which at first sight seems to demand unqualified assent, but if we pause to consider the history of successful research work in medicine there are grounds for hesitation. Comparatively few men are gifted with the imagination, the persistence and the technical ingenuity which are so requisite to the explorer; and where these are present the mechanical bar of the standard curriculum is rather an imagined than a real handicap. The work of Ross or of Banting, or in earlier generations of Darwin or Jenner or John Hunter, is testimony to the fact that "the divinely gifted man" can "breast the blows of circumstance and grapple with his evil star." That is not a full answer to Dr. Cohn's contention however. He seems to maintain that for one gifted man who can overcome the "invidious bar" of the standard curriculum there are others who, capable of effective work, find their road blocked by the difficulty, or their course prolonged beyond due time by the length of the journey. To that view it is possible to give a qualified assent, bearing in mind that in other countries the medical curriculum is longer than it is here. Medical students in the United States are required to do eight years of college work followed by two years in hospital, so that they are twenty-nine or thirty before they can earn their living professionally. We can also join with Dr. Cohn in condemning the time-lag in the reform of the curriculum. There is nothing to be gained, as he points out, by waiting until a more or less violent upheaval of our standards becomes necessary; we should be constantly adjusting them to meet the needs of the coming generation.

1. Fisher, A. M. and Finney, G. G. *Bull. Johns Hopk. Hosp.* 1940, **66**, 263.
2. Remarks on Professions in Medicine, *Science*, July 26, 1940.

POSTOPERATIVE VENOUS THROMBOSIS

IN genito-urinary surgery there is a high incidence of venous thrombosis and pulmonary embolism; and in a paper dealing with these complications in the Brady Urological Institute of the Johns Hopkins Hospital, Culp,[1] has made suggestions for their prevention, early diagnosis and treatment. By way of prevention he forbids the use of intravenous infusions unless absolutely necessary and emphasises the importance of avoiding venous stasis after operation. Regarding sepsis as an important factor, he advises the use of bacteriostatic agents during operation. He suggests routine leg measurements on admission and before and after operation, on the grounds that a slight swelling of the limb, not appreciable by the naked eye, is an early sign giving warning of the danger of pulmonary embolism. He describes cases that were submitted to operation when thrombosis was already present—an accident that may easily happen in this type of case. If routine leg measurements are to be employed they might usefully be combined with examination for deep tenderness and delayed cooling on exposure, which Pilcher [2] has described as early signs of thrombosis. Culp's suggestions for treatment of thrombosis may well be disputed; he advocates absolute rest in bed although he agrees with other observers that venous stasis is an important cause of the condition. Surely rest in bed is one of the best ways of producing venous stasis and may well encourage thrombosis to spread or even to start elsewhere. But, as Homans [3] says, why worry about casual exercise when the patient must practise daily the athletic feat of using the bedpan? Homans, who also attaches great importance to venous stasis, is more logical in his treatment. When thrombosis is diagnosed he advises postural treatment in bed, to promote venous drainage and absorption of œdema; he allows exercise of the limbs, and gets the patient up as soon as the swelling has subsided. In certain cases he advises division of the femoral vein, but although there have been several reports of this treatment the results are not numerous enough for its value to be assessed.

SPECIFIC CONTROL OF MEASLES

UNTIL such time as active immunisation against measles becomes possible the only efficient method of control is by partial or complete passive immunisation of susceptible contacts. The use of human immune sera for this purpose has already proved an inestimable boon to hospital administrators but no great effect on the gross mortality of the disease may be anticipated until preventive inoculation is widely and consistently practised among familial contacts in the home. An example of an organised attempt on these lines is reported by the Public Health Department of Chicago.[4] On receiving a notification of measles the home was visited by a health-department investigator who quarantined the primary case and prepared a list of contacts. Some of these were inoculated with convalescent measles serum in age-adjusted amounts of 3–5 c.cm. and some with a placental extract in doses of 2–3·5 c.cm.; the remainder acted as controls. Generally speaking the control group consisted

1. Culp, O. S. *Bull. Johns Hopk. Hosp.* July, 1940, p. 1.
2. Pilcher, R. *Lancet*, 1939, **2**, 629.
3. Homans, J. *Amer. J. Surg.* 1939, **44**, 3.
4. Bundesen, H. N., Fishbein, W. I., Abrams, I. R. and Miller, R. D. *J. Amer. med. Ass.* July 13, 1940, p. 104.

of older children who might best be expected to weather an unmodified attack of measles. Of 299 children given convalescent serum 73·2% did not develop measles, 24·7% experienced a modified attack and 2·1% an unmodified one; the corresponding figures for 678 children inoculated with placental extract being 52·1%, 43·1%, and 4·8%. Amongst 328 controls only 26·6% escaped measles but in fully three-quarters of those attacked the disease was mild. Nevertheless, the claim that "modification" was attained in nine out of ten of the inoculated cases who developed measles appears to be reasonably well based on a careful follow-up and record of individual symptoms and signs. The high protection-rate of 73·2% for the convalescent-serum group approximates fairly closely to experience in this country, as does the finding that about a quarter of contacts escaped measles even without passive immunisation. No advantage could be seen for cases injected before rather than after the sixth day of the incubation period, an apparent anomaly which has already been noted by Gunn [5] in hospital practice. Placental extract, although affording a protection-rate twice that of the controls, was much inferior to convalescent serum in the doses given. Since adult measles serum was not used in this experiment no precise comparison can be made but it is probable that, in antibody content, placental extract lies somewhere between the other two preparations. Its optimum dosage still remains to be fixed.

THE VOLE BACILLUS

THREE years ago Wells [6] reported his discovery of a chronic infection of field-voles which in its pathology and its ætiological organism closely resembled tuberculosis. Both he and Griffith [7] have shown that the vole acid-fast bacillus is pathogenic for other laboratory animals—guineapigs, rabbits, hamsters—but is less virulent and produces a more chronic disease with little glandular caseation in these animals than does the bovine tubercle bacillus. Griffith [8] also found that the vole is susceptible to the two animal types and the avian strain of tubercle bacillus, and that it has advantages over the rabbit for the differential typing of the human and bovine strains. The low-grade virulence of the vole bacillus suggested to Wells the possibility of using it to vaccinate animals—and perhaps man—against tuberculosis, and he and Brooke [9] have lately recorded experiments in guineapigs which indicate that the organism may be a much more reliable means of active immunisation than the attenuated B.C.G. Finding that subcutaneous injection of less than 5 mg. of culture of the vole bacillus produced only a local regressive lesion in the guineapig, they were able with amounts totalling 1–2 mg. in single or repeated doses to render guineapigs resistant to infection with virulent human and bovine strains of tubercle bacillus. This finding was the more remarkable in that guineapigs vaccinated with much larger doses (30 mg.) of B.C.G. were not at all protected against the same bovine and human strains. Vaccination against tuberculosis with B.C.G. either in men or cattle has not been encouraged in this country, partly because of the original uncritical reports of the French workers, partly because of equivocal experimental results, and partly because of the instability of the B.C.G. vaccine and occasional accidents resulting from its use. That satisfactory results with B.C.G. can be obtained has been demonstrated by American and Scandinavian workers, and few will deny that there are openings for immunisation against tuberculosis in animal husbandry and—more important to medicine—among the children of tuberculous parents. The vole bacillus may provide the safe and effective vaccine for which we have searched so long. Experiments in calves and monkeys should presently give us the answer.

5. L.C.C. report on 1935–36 measles epidemic, London. No. 3384.
6. Wells, A. Q. *Lancet*, 1937, **1**, 1221.
7. Griffith, A. S. *J. Hyg., Camb.* 1939, **39**, 154.
8. Griffith, *Ibid*, p. 244.
9. Wells and Brooke, W. S. *Brit. J. exp. Path.* 1940, **21**, 104.

CHADWICK TRUST

IT is half a century since Sir Edwin Chadwick died at the age of 90, but the provision he made by his will for developing the sanitary reforms with which he was associated still keeps his memory green. Emerson said that "an institution is the prolonged shadow of one man," and that is true of the Chadwick Trust. Under a scheme established by the charity commissioners in 1895 and revised in 1924, the trust has subsidised the teaching of hygiene and municipal engineering at University College; the trustees have organised travelling scholarships and awarded prizes and Chadwick medals in various branches of sanitary science and administration. Once in five years a gold medal and a prize of £100 is awarded to the medical officer of the Navy, Army, or Air Force who has specially distinguished himself in promoting the health of the men. This year the award appropriately fell to Group-Captain P. C. Livingston of the R.A.F. Since 1913, the trustees have organised the well-known Chadwick public lectures in London and large provincial towns. Some 300 of these have been delivered dealing with the social, medical, architectural, engineering, administrative and legal aspects of sanitary science, and addressed alike to postgraduate students and the general public. In a series of these lectures to be held between Oct. 8 and Dec. 10, Sir Walter Langdon-Brown will speak on mental health in war-time, Mr. J. C. Dawes, of the Ministry of Health, on the cleansing of towns and cities, Mr. F. H. Hiorns, architect to the L.C.C., on hygiene technique in building and Dr. W. A. Brend on traumatic neurasthenia. The repute enjoyed by the Chadwick Trust has attracted to it certain benefactions such as the Malcolm Morris memorial and one donated by Mr. A. C. Bossom, M.P. The trustees in 1933 endowed a Chadwick prize at the London School of Hygiene and Tropical Medicine and in 1934 founded a Chadwick lecture in connexion with the Royal Society of Tropical Medicine and Hygiene. The memory of Sir Edwin Chadwick, as "the father of British sanitary science" is thus worthily kept alive. The reforms which he advocated, and for which he was hounded from office in 1854, have become the commonplaces of modern sanitary administration. It was his contemporary, Sir John Simon, who credited Chadwick with having taken "a first step in the modern utilisation of medicine by the state."

Mr. JAMES STUART, M.P., has been appointed a member of the Medical Research Council in succession to Mr. R. K. Law, M.P., who has resigned, and Sir WILSON JAMESON has been appointed in succession to Prof. Matthew Stewart, who retires on Sept. 30.

WE recently suggested [1] that solutions containing benzol should be labelled in order to regulate its use and to help to prevent poisoning by this solvent. Dr. Manfred Bowditch, director of the Division of Occupational Hygiene in Massachusetts, writes to say that the labelling of solutions containing benzol has been a legal requirement in that state for the past seven years. The law requires that all receptacles holding solutions containing benzol shall be clearly marked: "Benzol. Beware of poisonous Fumes"; or with the words: "Volatile solvent, poison. Use with adequate ventilation. Avoid prolonged breathing of vapour." The percentage of benzol in the solution must also be plainly indicated on the container. Exemptions from labelling can be obtained when the receptacle is used for outdoor transport, when the solutions are used exclusively for motor fuel, and when they contain less than 1% by weight of benzol.

1. *Lancet*, 1940, **1**, 792.

Special Articles

AN EPIDEMIC OF CHICKENPOX

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THE epidemic of chickenpox here described throws a little light on the period of infectivity and the incubation period of the disease.

At the time of the epidemic Cuckfield hospital contained, from the nursing point of view, four units, mainly for children, and a maternity department. The units were :

A. One ward of 25 beds.
B. Five wards of 25, 8, 2, 2 and 2 beds.
C. One ward of 25 beds.
D. Six adult wards of 25, 8, 8, 4, 2, 2 and 1 beds. The 25-bed ward was used for children after the middle of March.

Children who developed chickenpox were removed on the day the rash appeared to two-bedded wards in unit B and nursed there, with the usual precautions against the spread of infection, until the scabs had fallen, when the patients were returned to the main wards. Nurses who developed chickenpox were removed to the small wards in D.

On Dec. 12, 1939, a boy with nephritis was admitted to A. He developed chickenpox on Dec. 26, and before

DATES OF APPEARANCE OF RASH IN CASES OF CHICKENPOX AT CUCKFIELD HOSPITAL, 1939–40

Case		Case	
1 P	Unit A Dec. 26	15 P	Unit A..Feb. 21
2 P	Unit A Jan. 9	16 N	,, C..Feb. 21
3 P	Unit A Jan. 22	17 N	,, A..Feb. 22
4 P	Unit A Jan. 22	18 N	,, B..Feb. 22
5 P	Unit A Jan. 22	19 N	,, C..Feb. 22
6 P	Unit A Jan. 26	20 P	,, D..Feb. 23
7 N	Unit A Jan. 27	21 P	,, B..Feb. 26
8 P	Unit A Feb. 6	22 P	,, A..Feb. 28
9 P	Unit A Feb. 6	23 P	,, C Mar. 8
10 N	,, B..Feb. 7	24 P	,, C Mar. 12
11 N	,, A Feb. 13	25 P	,, C Mar. 17
12 P	,, A Feb. 14	26 P	,, C Mar. 20
13 P	,, A Feb. 19	27 P	,, B..Apr. 3
14 P	,, C..Feb. 20		

P = patient. N = nurse.

being removed from the ward infected another child whose rash appeared on Jan. 9. He in turn, infected four more children and a nurse. Eventually twelve children and three nurses in that ward had the disease (see table).

A nurse (case 10) in B contracted the infection from nursing children who had been removed to the isolation wards there, and she presumably infected cases 18 and 21 in that unit. Shortly before developing the rash she worked for two hours in C, and started the outbreak there.

One patient (case 20) in D was not known to have been in contact with any other case, but he was a mental defective who was up and about the hospital, and was unable to give a satisfactory account of his wanderings. The last child to be affected (case 27) had not been in the ward with any patient with chickenpox for 5 weeks, and for lack of a better explanation it was assumed that she was infected by unidentified fomites from the neighbouring isolation wards or by a nurse acting as a temporary carrier. Thus there were twenty-four cases probably due to infection from patients or nurses in the same wards; in cases 1 and 20 the information was insufficient; in case 27 contact with a case was improbable.

INFECTIOUS PERIOD

Chickenpox is usually thought to be transmissible for a short time before the rash appears. The truth of this opinion is demonstrated by the following cases.

Infectious at least one day before the rash appeared (Schamberg and Kolmer 1928).—"A physician's daughter aged 16 years developed a slight sore throat and a little fever, and was isolated in a room in the upper story of her home. A small whitish patch was noticed on the posterior pharyngeal wall. On the following day the eruption of chickenpox appeared. An eight-year-old brother who was with the patient on the previous day was kept in a distant part of the house, out of all communication with the sister or her attendants. Sixteen days after the exposure, the same having taken place before the appearance of the eruption, the boy developed chickenpox."

Infectious at least two days before the rash appeared (Goodall and Washbourn 1896).—"Case 1, Mary C., aged 4 years, was admitted into the Eastern Hospital with scarlatinal nephritis on Oct. 18. She was also the subject of marked varicella . . . the chickenpox eruption came out on Oct. 16. . . . Another child, William C. (Mary's brother) had been removed to the North Eastern Fever Hospital on Oct. 14, and there were no other cases of chickenpox in the house. William C. had scarlet fever when removed, but not chickenpox . . . on Nov. 2 he was attacked with that disease; this gives an incubation period of at least 19 days . . . it would seem that varicella may be infectious before the outcome of the rash."

Infectious four days before the rash appeared (Case 10 in Cuckfield epidemic).—The nurse came in contact with chickenpox in unit B. On Feb. 3 she went as relief nurse for two hours to C, a "clean" ward segregated from the others. On Feb. 7 she developed chickenpox. Case 14 was confined to bed in C at that time, but developed chickenpox on Feb. 20. Varicella also appeared in two nurses from C on Feb. 21 and 22 (cases 16 and 19), but they could have acquired the infection at meal-times from case 10 on Feb. 4, 5 or 6, before her rash appeared. (She lived outside the hospital and was nursed at home, and she was not in the hospital on the day of the eruption.)

Since our patients were isolated until the scabs had fallen I have no observations of the time for which an individual remains infectious after the appearance of the rash. Pickles (1939) writes that "the disease is certainly very infectious in the early stages and probably in the last few days of the incubation period, and remains infectious for at least a week after the appearance of the rash." Thomson (1919) found that the introduction of children, who had had the disease for 8, 7 and 6 days respectively into a ward containing susceptible children did not induce infection. Two children were brought into the same ward on the 5th day of the illness, in one case no chickenpox followed, in the other three out of twelve susceptible children developed it.

INCUBATION PERIOD

Inoculation of the skin produces local varicella on the eighth day (Steiner 1875, Bigger 1937). Beckman (1935) reported accidental inoculation of the circulating blood by transfusion from a donor who developed varicella 3 days later. The recipient died on the 15th day with signs of encephalitis, the onset of which was gradual. The natural route of infection is probably through the mucous membrane of the upper respiratory passages.

Infection from patients with herpes zoster has been noticed on many occasions. Pickles (1939) had "an instance of infection from a sufferer from herpes zoster at a public celebration when the incubation period was in two patients respectively 14 and 17 days." He gives other examples, one of which suggests an incubation period of 13 to 15 days, though it may have been longer.

Patient-to-patient infection can give precise information when the exposure was short, preferably one day or less. Dukes (1892) reported a case when the rash appeared 14 days after exposure. Case 14 at Cuckfield developed chickenpox 17 days after a single exposure. Two nurses (cases 16 and 19) were affected 18 and 19 days respectively after the same exposure, but it is not certain that there was no other exposure during the next three days. In some published cases there was exposure on two days only. Of these, in Dukes's case 26 (1892) the incubation period was 13–14 days, and in his cases 16, 17, 18 and 19 it was 18–19 days.

It has been pointed out that chickenpox may be transmitted by the patient on the appearance of the rash, and during the previous 4 days. Allowing for this, and knowing the variations of the population of the wards from day-to-day records of children and nurses it is possible to calculate when any patient was exposed. From this one may discover the minimum variation of the incubation period which can account for all the cases.

This has been done for the Cuckfield epidemic and for five small hospital outbreaks recorded by Goodall and Washbourn (1896), six small outbreaks at school published by Dukes (1892), and single cases described by Stedman (1892) and Schamberg and Kolmer (1928). In the total of sixty cases exposure was commonest on the 19th day, and an incubation period of 16–19 days would cover 90% of the cases, but an incubation of 14–20 days inclusive is needed to account for all. In a case seen by Rodonachi (1896) which was complicated by measles the incubation period was apparently at least 24 days. The high incidence of exposure 16–19 days before eruption compares interestingly with the period of 13–14 days that most often separates the cases in small epidemics in families, hospitals or schools. It suggests, though it certainly does not prove, that the patient is more dangerous to his companions some days before the rash appears than he is at the time of the eruption.

CONTROL

Although isolation may have prevented infection of other children exposed after the appearance of the rash, it was found impossible to check the epidemic by this means, since the disease is transmissible for a considerable time before the eruption appears. The disease is, however, rarely severe, and, as most people acquire it and subsequent immunity at some time, little would be lost by abandoning the policy of isolation.

Segregation of the unexposed and the exposed but insusceptible children from the rest was more successful. At one time all except one eight-bed ward (in B) were in quarantine for chickenpox, and this ward was full. Patients were exchanged between wards, and twenty-five a bed ward (A) was filled with the eight unexposed children and a number who had already had chickenpox. Both wards were staffed by nurses who had had the disease. No further infection with varicella occurred in these two wards, and new patients could be admitted to the hospital without being exposed to the risk of infection.

Varicellisation is said to be an unreliable method of producing infection, but it might be tried for it should produce a mild and brief form of the disease which would be over in less time than the quarantine period of 21 days.

SUMMARY

An epidemic of chickenpox involving twenty-seven patients and nurses in a children's hospital was started by the admission of a boy who was incubating the disease, and transmitted to other open wards by a nurse who acquired varicella after working in isolation wards containing patients suffering from the disease.

Chickenpox patients may be infectious for 4 days before the appearance of the rash, on the day of its appearance, and for 4 days afterwards. Isolation at the onset of the disease is, therefore, ineffective in preventing the occurrence of further cases.

The incubation period varies at least between 14 and 20 days inclusive.

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NON-ESSENTIAL DRUGS

HINTS TO PRESCRIBERS

THE Government is anxious that tonnage and foreign currency should not be used to import drugs which are not essential in war-time or for which substitutes can be obtained at home. At present there is something like a vicious circle. Because there is no immediate shortage of them, drugs which are not essential continue to be used, and as they are used further supplies are imported to keep up the stock. After surveying the range of drugs commonly used in medical practice an advisory committee, composed of recognised leaders of medical thought, has prepared three lists of drugs which are classified as follows.

(*a*) Drugs which are regarded as essential.

(*b*) Drugs which are essential for certain purposes but the use of which should be restricted.

(*c*) Drugs which are not essential and do not justify importation or manufacture in war-time.

No detailed survey has been made of the hormones and vitamins and such biological products as antitoxins, sera and vaccines, partly because such products are being considered by special committees which may be expected to make recommendations in due course.

Since category (*c*) seems to prompt immediate action, it may be well to deal with it first. It consists of the following:

Glycerophosphoric acid and glycerophosphates, hydrobromic acid, tartaric acid, aconite, balsam of Tolu, buchu leaves, calumba root, Indian hemp, cantharides and cantharidin, cardiazol, caraway seed, cassia bark and fruit, black catechu, cochineal, balsam of copaiba, coriander seed, cubebs, kousso, fig, gelsemium, gentian, hamamelis, jalap, krameria, linseed, lobelia, pelletierine tannate, cream of tartar, psyllium, salicin, salol, scammony, squill, senega, sodium tauroglycocholate, sparteine, strophanthus, tamarind, taraxacum, the oils of pine, almond, camphor, cardamon, caraway, croton, gaultheria and sandal wood, and the following compounds of iron: arsenate, iron and manganese citrate, iron and quinine citrate, iron and potassium tartrate, iron and strychnine citrate, glycerophosphate, hypophosphate, lactate and injection of iron.

Substitutes are suggested in a number of cases. Thus in place of aconite, benzocaine is suggested for local application. For buchu leaves, balsam of copaiba, cubebs and sandal wood oil the committee suggest sulphanilamide, hexamine, mandelic acid, sodium benzoate and scoparium. Other recommendations are hydrochloric acid and sodium bromide for hydrobromic acid; citric acid for tartaric acid; quassia for calumba and gentian; sinapis for cantharides; dill seed for caraway seed; cardamon for coriander seed; male fern and carbon tetrachloride for kousso and pelletierine tannate; synthetic analgesics for gelsemium; tannic acid for witch hazel and krameria; colocynth for jalap; kaolin poultice for linseed poultice; ispaghula for psyllium; sodium salicylate for stramonium; nikethamide and leptazol for lobelia; turpentine for camphor oil; methyl salicylate for gaultheria oil; sodium salicylate for salicin; Indian podophyllum for scammony; Indian squill for squill; iodides, ammonium carbonate and ammonium chloride for senega; extract of ox bile for sodium tauroglycocholate; and digitalis for strophanthus.

Iron sulphate is suggested as a substitute for other iron salts, and it is pointed out that leptazol of home manufacture is identical with cardiazol.

Public Health

School Services in War-time

THOUGH we deplore the partial breakdown in the continuity of the school medical service which occurred as a result of evacuation, it is encouraging to observe that the press and the public have expressed dissatisfaction with it. The Board of Education should have made it clear from the start that the medical inspection and treatment of school-children, including dental attention, was to go on uninterruptedly despite the war and that transferred children were the care of the reception authorities in whose areas they were billeted. It should also have been clear that the reception areas, however efficient they were in doing their own work, could not supply the service to greatly increased numbers without help from the evacuating authorities. In their recent circular (No. 1583) the board suggest that if replacement of staff called up for military service proves "impossible" the scope of the work must be restricted, "but as there will be greater depletion of staff in some areas than in others, it is not desirable that the board should suggest a scheme of curtailment to be applied uniformly in all areas." But surely it is the business of the board to see that there is no curtailment anywhere and that where temporary difficulties occur, owing to the calling up of doctors and dentists for military service, the gap is filled without delay. The dental service suffered most because few local authorities had a fully efficient dental scheme before the war started and much of it was carried out by

part-time dentists who obviously could not be translated from their practices. Some delay in the continuity of conservative dentistry was therefore excusable, but as the public was beginning to appreciate the value of school dentistry it was vital to ensure that this growing interest was not discouraged. This will not be achieved by the advice in circular 1523 that the amount of work done should be dictated by the personnel available and not, as it should be, by the requirements of the children. There is no encouragement to local authorities to make an effort to secure the most efficient service possible in the circumstances and some of the evacuating authorities, though fortunately not the majority, thinking more of their financial liability than of the health of their children, have added their curb to that of the board to limit the activities of the reception authorities to the least that the country will tolerate. We can still hope that the public, now convinced of the benefits of the school medical and dental services, will not submit to their curtailment if it can possibly be avoided.

INFECTIOUS DISEASE IN ENGLAND AND WALES

DURING THE WEEK ENDED AUG. 24, 1940

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1257; whooping-cough, 1046; diphtheria, 829; enteric fever, 137; measles (excluding rubella), 6688; pneumonia (primary or influenzal), 349; puerperal pyrexia, 148; cerebrospinal fever, 131; poliomyelitis, 39; polio-encephalitis, 9; encephalitis lethargica, 1; dysentery, 40; ophthalmia neonatorum, 96. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on Aug. 23 was 742, made up of: scarlet fever, 134; diphtheria, 153; measles, 49; whooping-cough, 28; enteritis, 59; chicken-pox, 27; erysipelas, 33; mumps, 9; poliomyelitis, 1; dysentery, 9; cerebrospinal fever, 26; puerperal sepsis, 29; enteric fevers, 50; german measles, 2; other diseases (non-infectious), 56; not yet diagnosed, 77.

Deaths.—In 126 great towns, including London, there was no death from smallpox or from scarlet fever, 1 (0) from enteric fever, 5 (1) from whooping-cough, 5 (1) from measles, 12 (1) from diphtheria, 33 (4) from diarrhœa and enteritis under 2 years, and 6 (2) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 190 (corresponding to a rate of 35 per thousand total births), including 20 in London.

In England Now

A Running Commentary by Peripatetic Correspondents

Adolf arrived, as current slang goes, in time for a meal as usual—Sunday supper on this occasion. We listened crossly to the sound of wheelbarrow races being conducted across the rather badly laid floor of heaven and went on putting away cold beef to the song of the sirens. "We'll get to bed early," my aunt said comfortably, "and then we won't notice it." But this time we had reckoned without the nuisance value of our lively Saxon cousins. They popped across in droves, apparently sticking to one high road—the milky way, perhaps—and as they came past one landmark—skymark?—a little gun went off; half a minute later they reached some other chosen spot and a nearer gun joined in; and of course the visiting team were dropping things all the time so there was no sleep to be had. Somebody opened the back door and the cat shot in looking black affronted; with a nice sense of personal values he took up a position in a clothes-basket under the stairs. The dog, a Staffordshire bull-terrier who has the proud kennel name of Bocking Amos but is more accurately known as Porkie, took a poor view of the whole thing, laying a mournful head in every lap in turn. I was invited to prescribe for him, and found some Sedobrol in the sample cupboard. He thought it lovely and was shortly reduced to a heavenly languor in which he would open one eye, smile dreamily and ooze a little further over one's knees under the impression that he was a lap-dog. About midnight my uncle, who affects a Melancholy Jacques delivery, muttered gloomily that some people had no consideration and went to bed. The rest of the party also went to bed in relays through the night and returned at intervals to the basement—dogged but defeated of sleep—for tea, biscuits and conversation. Even my uncle, enfolded in his entire bedclothes including an eiderdown which gave him the look of an orange water-snail, came heavily down again remarking that it was time somebody told Hitler to call his cattle home. The two air-raid wardens in the family, who were supposed to be having a night off, exchanged bitter condolences, and my aunt, an incorrigible adventurer, kept slipping off like sister Anne to the watch tower, to look for excitement from the topmost window. My uncle, whenever he detected her absence, muttered in disgust "She's peeping again," and went off and retrieved her. Towards five o'clock I remember lying on my back and being dogmatic and insulting about Ruskin whom somebody had brought into the conversation in quite a kindly spirit. We all went to bed for the last time after that, and had the pleasure of hearing the all-clear (which goes on too long and too loud) as we settled down to an hour's sleep.

At eight o'clock I opened the front door thinking to find London hanging together by a thread. The street had its usual drowsy aspect; the dew was on the grass and I heard the rattle of a milkman. Incredible that so much noise could be rewarded with so little obvious result.

* * *

My partner is a member of a medical board for the examination of recruits. Though apt to dwell at some length on its arduous nature he obviously enjoys the work. His morale varies directly with the standard of physique encountered on any given day but he is constantly impressed by the spirit of the men themselves. On being confronted one day with a man, otherwise grade A, but with a pair of very flat feet, my partner scratched his head. "I don't like those feet of yours, old man," he said. "That's all right, sir," replied the recruit, "I've 'ad 'em for years, and I likes 'em all right." Another man, otherwise physically hefty, had a hammer toe. "Does the toe ever cause you any trouble?" he was asked. "Never, sir," was the instant reply, "you can take it from me, sir, I'm O.K. I got four brothers all in the Navy and mother never bred a jibber yet."

* * *

The Phantom Aerodrome or It's an Ill Wind.—One Saturday evening about 9 o'clock an Army lorry trundled up to our front door to the strains of "Roll Out The Barrel" from its cargo of a score of war-like soldiers. We met in the hall an important looking officer who introduced himself as a captain, though his tunic bore only two pips. He said he had come to defend our aerodrome. We told him that so far as we were aware we had no aerodrome, but this he flatly refused to believe. One would not expect an aerodrome to be easily mislaid but somehow ours appeared to have been lost. The officer did not know exactly where it was supposed to be but was sure it must be somewhere and thought we ought to know something about it. No, he had no map showing its position, but he believed it was a stone's throw from the hospital. Anxious to do our bit to facilitate the defence of the aerodrome we set out on a tour of likely places in the vicinity, scampering with the officer over fences, up hills and down dales, ploughing through bunkers, until all of us were showing signs of bellows to mend, especially the officer who was loaded with all the impedimenta of war. But all to no purpose; nothing like an aerodrome could we find, and it was a tired and rather irritable officer that returned with us to the hospital. We suggested that he might care to inquire the whereabouts of our aerodrome from the officer commanding the area, or from the R.A.F. station thirty miles away, but there again he drew blanks, for nobody had even heard of our aerodrome. In the corridor we met a V.A.D. on whom his eye lighted hopefully as an old friend. "My God, Lorna," he greeted her, "this is a dreadful place; is there no whisky here?" There was neither whisky nor aerodrome, and as he seemed to be set on another voyage of exploration we offered to procure a meal for him and the twenty noisy ones, who were still rolling out the barrel under the bedroom window of a choleric member of our staff. Yes, they would need food, but he did not know when they would be able to get it for they would have to guard the aerodrome. To our untutored eye that

appeared to be problematic, but we announced firmly that food would be ready for them in one hour's time and with that we bade them adieu. In the morning we learned that our visitors had tarried until 3 A.M. and had eaten fourteen pounds of roast beef and twenty-two loaves of bread. Except for a crestfallen officer they departed in high spirits, still rolling out the barrel and declaring that this had been their best night since joining the Army. We subsequently ascertained that the aerodrome, always a bit nebulous, had disappeared altogether some years ago, and was now rearing an excellent crop of potatoes.

* * *

When primitive man first of all with chalk made on the cave wall a sign which conveyed to a chosen friend or two a meaning, he and they found they had created for themselves a new power, power to communicate without being present, to record, to taunt, to voice opinions with impunity, the executive power of the pen, and this gave them a feeling of superiority which is still apparent in many an office clerk. There was once a man who use to travel up to London every day on the old G.E.R. who laid down the law to his fellow-passengers about cricket. He practically selected the test team and was authoritative on every cricket subject. He didn't appear on Saturdays, but during the week would casually mention, "We did pretty well on Saturday—a first wicket stand of 106 against the Old Bunhillians," something of that sort. Apparently he belonged to a well-known club, and from the way he verbally took bowlers off and selected the order of batting, everybody thought he was captain. Years later it turned out he was the scorer. He felt, and I suppose with some justice, that he controlled the whole game. I've known clerks to insurance committees and hospital secretaries imbued with the same feeling of superiority, and even historians have often mixed up the functions of recording angel and omniscience. This office-clerk complex is particularly noticeable in the mercantile marine and accounts for much that is unsatisfactory in it. I know a shipping company which not very long ago celebrated its centenary and published a book about itself. During that time its ships, sojourning the seven seas, must have had wonderful adventures, which would make good reading. They were hardly mentioned; it was all about the office staff. "In 1871," we read, "Mr. Jones became manager and it was owing to his wonderful energy and foresight . . . the new office building was erected in 1904 and a new fleet ordered the next year, and this was entirely due to Mr. Brown . . . during the depression of 1910 the company was saved by the heroism of Mr. Smith. . . ." The sea and the gallant seamen were very secondary affairs. Here is an extract from a letter from another shipping company endeavouring to appoint me surgeon to a liner. "We are not agreeable for our Medical Officers to charge a fee to passengers for medical attendance but if passengers willingly volunteer on their own account to acknowledge your services by offering you a fee, under these circumstances we have no objection to your accepting same." Ink can be heady wine, but typescript, especially on a stomach empty of grammar, is raw spirit.

* * *

Some of us medical officers in charge of mobile units in rural areas have, in our insubordinate way, been wondering about them. My particular travelling circus consists of 10 souls (if they all turn up), 2 cars and a crazy van full of complicated apparatus packed partly in cupboards and partly in a sort of outsize and extremely heavy coffin. We have a cruising speed of about 25 miles per hour. I am told that we serve a twofold function: first, to hasten to any adjacent village which may have been raided and suffered considerable casualties; secondly, to proceed to divers large cities and towns (some of them 3 or 4 hours' journey away) to reinforce the medical services there in the event of massive and prolonged air-raids. Now I may be an optimist but it seems to me that anything in the nature of intensive bombing of small villages of no military importance is, to say the least of it, unlikely even in this war. What has happened, and what will doubtless happen again, is that odd bombs, jettisoned by justly nervous Nazis, have fallen on or near villages causing one or two casualties and the local doctor, by virtue of his proximity, has been and will continue to be called, just as he is for road accidents or any other emergency. Clearly there is no place for the mobile unit here, for by the time it has assembled, loaded up and reached the site of the incident, all the work will have been done. Nor can I visualise our being called upon to exercise the second part of our function—namely, the reinforcement of the medical services of large cities or towns perhaps 100 miles away. Professor Trueta tells us that speedy transport to a hospital where deliberate treatment of bomb wounds can be carried out is of first importance if lives are to be saved. Those casualties who are expected to lie about for several hours until we can reach them with our splints and bandages will either have died before we get there or, more probably, gone home in disgust. Once more I ask, where does the mobile unit come in? I submit that one doctor, in his own car and with his own accident bag and a few splints, makes an excellent mobile unit. What we require in rural areas is a better ambulance service—and less first-aid.

* * *

Our air-raid wardens have been sitting for a first-aid examination. Gathered in the local schoolroom, they were quietly confident, for they had been well coached. They had been told that an epileptic fit can easily be recognised by the sterorterous breathing, and that when splinting a fractured femur they must not forget the perennial band. This sharing of terms between medicine and horticulture is of course well established. Readers of "An Innkeeper's Diary" will be reminded of a prank played by its versatile author, John Fothergill. He had asked a famous scholar-poet, whom he was showing round his garden, how to pronounce *œnothera* and was nettled by the reply "evening primrose." So he "proceeded to point out all the plants with vile names. 'There's *Herniaria*; . . . that's *Monarda fistulosa*; that's *Lobelia syphilitica*, I got it to give it a good home; and over there I have a *Phallus amorphus*, but it hasn't come up yet.'" Nor must one forget the sharing of zoological and medical terms, as witness Mr. Bobby Howes's wild beast of the Amazon, the dreaded Stethoscope. Nevertheless, certain questions puzzled some of the candidates. The oldest lady warden, for instance, could not decide how many splints she should put on the frontal bone, which runs up the front of the leg. Our informant had to deal with an imaginary Pott's fracture on the person of a boy scout. He was proceeding to push a narrow-fold bandage gingerly under the limb with the aid of a splint when he was stopped by the victim. "Don't be silly," said that experienced young man scornfully, "the doctor isn't looking." Thereafter, with the patient keeping watch, the fractured limb was splinted without trouble. The wardens are now awaiting experience, most mercifully withheld here. In the meantime the lady wardens are fiercely making jam.

* * *

We have recently returned from the West Country, where we have been, rightly or wrongly, for a short holiday. Difficulties of localisation were paramount. The unaccustomed train journey was complicated by the anonymity of the railway stations. It was like being at a play without a programme, and the porters, who cry so merrily in screen and fiction, are now as silent as the signboards are blank. Formidable also are the difficulties of a country walk in unfamiliar territory. The most innocent inquiry as to one's whereabouts may bring forth unblushing mendacity. Tea-cottage proprietors, standing by their mineral water signs, assure one that they are strangers in those parts. (This is not solely a British habit. I remember once arriving in Germany at Trier, and on asking the way to the Porta Nigra, being informed by an apparently typical burgher that he was a stranger there.) Our holiday was spent at a place the beauty of which is more rugged than obvious. A friend of mine once said hopefully that the place grew on one. "Well," said his hearer scornfully, "if it grew on me I'd have it amputated." War disturbance in this place is more potential than actual. Food rationing has, however, been introduced there. We saw a notice, "conceal your lights," posted in the window of a small butcher's shop; on reflection, however, we realised that this did not necessarily adumbrate a shortage of unrationed meat.

Letters to the Editor

INDUSTRIAL TUBERCULOSIS

SIR,—Dr. Jessel's reasons against the use of mass miniature radiography presuppose that it would be the beginning and ending of medical investigation. If that were so, many of us would agree. All that is claimed for this scheme is that it immediately points to an abnormality that might easily be missed, even by expert clinical examination, and much more easily during routine examination of large groups of factory workers. A system which enabled so many men, prematurely discharged from sanatoria at the outbreak of the war, to pass into the Army is wasteful and ineffectual, and it is doubtful if in peace-time under industrial conditions it would be much more efficient. Mass radiography would at least have caught out the man with bilateral A.P. who was passed fit and got to France, presumably because the M.O. could hear nothing on either side of the chest. All that mass radiography claims is to sort out a group of suspects (experience shows this to be 0·8 to 1% of the general population) who could at once be put under special expert observation. Once established, the cost would be small compared with the benefits gained, for if only 1 in 100 of these suspects were found to be actually in need of treatment for tuberculosis, the county of London alone would provide 800 such cases. I suspect the figure would be more like 1 in 10. Most sanatorium officers know of cases having reasonably careful clinical observation as outpatients who would have been admitted to sanatoria months earlier if an X ray had been taken from time to time.

The detection of early tuberculosis by ordinary clinical methods is a very exacting process, and even the expert soon becomes tired and inefficient after a long session. Mass radiography should be a most valuable aid in allowing the expert to spend his time more efficiently in following up radiologically abnormal cases and selecting those that should be excluded from industry and placed under treatment or special supervision.

Wokingham, Berks. WILLIAM C. FOWLER.

SIR,—For a great many years I have been insisting upon the power and influence of the economic factor in relation to the treatment of disease, and especially of tuberculous disease; but never have I succeeded in emphasising this more vividly than Dr. Morgan, who is of course particularly well qualified to appreciate and express the patient's point of view. It is too rarely realised, even now, that the worker is more interested in working, and earning, than in questions of public—or even personal—health. He needs to earn, because "on that depends his whole economic status and standard of life (however low)"—as Dr. Morgan says. Anything which prevents, or may prevent, him from earning is therefore actually or potentially inimical to him; and to expect his coöperation, for the public good, in public-health measures which may effect his own ruin is to demand a degree of idealism far beyond normal human experience.

There are therefore two courses open to us: to make such measures compulsory, to insist that the public interest requires individual sacrifice—as is done wholesale in time of war; or to make the voluntary system work by reducing the degree of idealism required. Whichever course we adopt we shall ultimately be confronted by precisely the same problem: that of employing or otherwise providing for the unfit. We may therefore just as well consider at once how to make the voluntary system work, because if it can be placed upon a reasonable basis any need for compulsion will disappear.

We have endeavoured at Papworth to demonstrate the basis upon which the respective requirements of the public health and the individual worker can be harmonised, with harm to neither. The system works. Every public-health measure applicable to tuberculosis exists at Papworth; and the patients, after treatment, have the essential opportunity to earn. Some earn more with us than they ever earned when fit. None, once employed, has ever been stood off. All have had continuous paid employment; and these hundreds of men, and women, who would be instantly rejected as unfit by any medical examiner are now making a valuable contribution to the national war effort. Surely such a system, extended beyond the limits of a single demonstration related to a single disease, carries within it the solution of the whole problem? Who but a fool would resist a system of health protection which would provide permanent paid employment, without loss of status, for those found to be unfit? What need would there be of compulsion? Is a shipwrecked mariner compel'ed to enter a lifeboat?

Let us then extend that system and develop it on a nation-wide scale to cover all disabilities. No fundamental economic changes are required to effect this, as was shown by Lord Willingdon's suggestions with regard to a National Rehabilitation Board in the *Times* of Jan. 13 last. No masonic lodges or old school ties stand in the way. There is, in fact, no conscious opposition: only inertia, the tragic, almost fatal inertia, which in democratic countries so often paralyses action on any matter which appears to have no immediate vote-catching significance. If Dr. Morgan can rouse public interest—or, better still, public indignation—on this vital matter, he will compel action; and he will have succeeded where, so far, I have failed.

Papworth Hall, Cambridge. PENDRILL VARRIER-JONES.

TREATMENT OF WAR NEUROSES

SIR,—Professor Culpin has recently described in your columns the "diagnostic and therapeutic inertia that would not be tolerated in any other sphere than that of the neuroses" and in this connexion it may be of interest to record our own experiences in an E.M.S. war-neurosis centre.

To deal with the sudden demand at the time of the Dunkirk evacuation we were appointed as resident psychiatrists to one of these centres. Besides finding the centre unequipped to receive the men, having virtually nothing except beds and a (psychiatrically) untrained nursing staff, it came as a surprise to find that we were not free to practise psychotherapy. In one of many discussions we stated our view that the great majority of the patients were mentally ill, and as much in need of special treatment as a man with a broken leg. The director, who was a neurologist, disagreed with us, holding that except for the few who were exhausted, concussed or psychotic the men were not ill but in need of discipline and somewhat forceful encouragement. His frequent use of the term "scrimshankers" and his constant concern lest we be imposed upon by the men left us in no doubt about his real opinion of them. With such very different views on the ætiology and pathology of the condition it was not surprising that there was radical disagreement about its treatment. Psychiatric examination of the patients revealed much depression as well as anxiety. In a remarkable number of cases the depression was associated with the loss of close friends or horror at the treatment of refugees, in these respects resembling the major depressions of civilian life. The conditions of anxiety and depression called, in our view, for a period of rest with sedatives and so on, followed by suitable occupation combined with psychotherapy. The director, however, was hostile to any but the most superficial psychotherapy, remarking on one occasion that in his opinion psychotherapy was the cause of much neurosis in the last war. He did not wish the centre to be staffed on a scale which would make proper psychological treatment possible. Since the centre was almost completely unequipped and seriously understaffed we appealed to the E.M.S. consultants in psychiatry and neurology. The former was unfortunately indisposed and the latter made it clear to us by letter that he had no sympathy whatever with our demand for facilities to practise psychotherapy. The fact that many of our patients after his subsequent visit felt that he had called them cowards led us to think that he shared the director's opinion of the ætiology of the psychoneuroses of war. We naturally resented the attitude of the director to the men and felt that under the conditions obtaining at the centre it was impossible to do satisfactory work. At that time (the beginning of August) invasion was officially held to be imminent and a radical reorganisation was an immediate necessity. Having failed to influence our seniors we determined to

resign, partly as a protest and partly because in the conditions we could not continue to accept professional responsibility for patients, and also we wished to be free to practise psychotherapy elsewhere.

We do not regret having refused to tolerate the inertia of which Professor Culpin writes.

JOHN BOWLBY,
KENNETH SODDY.

London.

BOMB CONCUSSION AND THE EAR

SIR,—Major Craig's report in your issue of July 13 of cases of injury to the ears resulting from explosions calls attention to the need for preventive measures. Now, as in the last war, it may be difficult to get our sailors, soldiers and airmen to use the various gadgets that may be provided for their own protection. These should be fully and forcibly explained to the men by medical officers, and the type of ear plug chosen should be easily handled and cleansed, as well as effective in excluding noises and the effects of explosions and blast; but at the same time they should allow words of command and conversation to be heard. They should be such as can be worn in sleep without risk of falling out, causing discomfort, being unsightly or injuring the ear canal in any way. Cotton-wool, greased as suggested by Major Craig, is not very portable, may easily be infected, and blocks out ordinary sounds unduly; besides, portions of cotton-wool are apt to be left in the ear unwittingly. Various appliances are on the market, and amongst them Aurax ear protectors have much to recommend them. They are easily pocketed, durable, exclude loud noises, explosions and blasts but not ordinary sounds, and are easily kept clean. They can be worn day and night, and are not injuriously affected by ear secretions.

The question of the mouth gadget to prevent the blast injuring the ear, via the eustachian tube, should certainly be cleared up. The air entry through the small channel, via mouth or nose, must be very slight or negligible in comparison with the direct assault through the external meatus.

Chelsea, S.W.3. REDMOND ROCHE.

SIR,—In connexion with the annotation in THE LANCET of June 8 dealing with bomb concussion and the ear, it is worth noting that the ears may be naturally protected with impacted cerumen against high explosives. In a number of cases I have examined the ears soon after the explosion and found them intact. In one of these cases a man had a hand blown off and his face wrecked beyond recognition but the ears escaped injury because of impacted wax in both canals. Two men standing together were involved in an explosion, one of them had both ears impacted with wax and escaped aural injury. The other man had no wax in the ears and received serious aural injuries. I believe that the force of the vacuum created by the rarefied air of the explosion does more damage to the ears than the primary pressure of the explosion. The vacuum seems to suck out the tympanic membrane and ossicles, and I have even seen the external meatus stripped to bare bone. The use of soft rubber sponge firmly plugged into the ears can give the required protection. It is easy to fit into any shape ear canal and extremely easy to remove and can always be kept handy in bag or pocket. Its elasticity gives it a firm grip in the canal, and because of its softness does not hurt to wear at any age, and does not cut off the protected person from total aural communication.

Johannesburg. H. LEVIT.

PLASTER

SIR,—Not long ago I wrote in the *British Dental Journal* suggesting that among other useful means of employing dentists in war-time they might capably assist in the manipulation of plaster-of-paris in certain surgical procedures, particularly as the medical correspondent of the *Spectator* had stated that a number of surgeons were still not au fait with the best procedure for using this material. Apparently a letter in the *Lancet* proposing that "the dentist has no more part" in this work than "the house plasterer" has caused a great flutter among my fellow dentists. I do not read the *Lancet*—finding the *British Dental Journal* sufficient education for my professional needs—so I have not seen this letter, though I have read extracts from it and many criticisms of it. But the many promptings I have received to reply to the apparent slight in suitable terms seem to call for a certain reassurance on my part.

The very fact that I was tempted in the first place to outline the numerous ways in which dentists could be employed in war-time is evidence enough that I was fully aware of the undefined value, if any, the medical profession places upon our services. This surely is no time to enter into squabbles with our medical colleagues or to take offence at ill-considered opinions. And, however the expression was intended, where after all is the insult in the analogy? A good house plasterer is as useful in his field as others in theirs, provided they are also competent. With his special knowledge of plaster he might, indeed, do this work as well as a dentist. In fact, I should no doubt have proposed his coöperation with the surgeon in this capacity had not the Government decided to regard ours as a reserved occupation and not his, thus leaving more dentists available than house plasterers.

We must not be so sensitive to criticism. I am sure the medical profession would not shrink at similar evaluation of their efforts to help us. They would not take umbrage if we pointed out that their frequent efforts to diagnose pyorrhœa and advise multiple extractions are often far from correct. Nor would they be hurt, I am sure, if we told them that their constant endeavours to cure their incurable patients by seeing dental sepsis where there are only many discoloured fillings were unscientific shots in the intellectual dark. We must be broadminded and be prepared to give and take. When doctors sometimes fail in their administration of nitrous oxide because they are not trained anæsthetists; when they look to us to render patients edentulous because all the other removable parts of the patient have already gone without effecting a cure; when they beg us to see a focus of infection on radiograms that an obstinate arthritis or gastric ulcer may be explained—when they do these things they are seeking our aid and expressing, if a little ineptly, their appreciation of our specialised knowledge. That being so we cannot cavil if they prefer house plasterers to assist in surgical plastering. We are being used in nearly every capacity. What is one less in so many?

The medical profession knows, as the Government knows, we are always here and, thanks to our catholic education, ready to fill most gaps; in fact statistics show that we are already assisting doctors and surgeons to a great extent in divers capacities. When this war is over even the house plasterers themselves may need our help, and once again it is my hope that we shall not fail them.

Bournemouth. EDWARD SAMSON.

CLASSIFICATION OF AIR-RAID CASUALTIES

SIR,—It is not generally permissible for an author to take exception to a review of his work, unless the reviewer imputes to him statements he had not made, or views he does not hold. If the reviewer goes so far as to describe the author's alleged views as fanatical the unfortunate author may perhaps be allowed to correct the misapprehension.

The review of my book in your issue of Aug. 24 (p. 231) says that my criticism of the Government scheme is mainly confined to my "almost fanatical conception of classification and evacuation *points* [my italics]." The reviewer then proceeds to demolish me by pointing out that it is impossible to classify in the street. This is preaching to the converted with a vengeance! I would point out, if I may, that so far as I am aware I was one of the first to make this observation in print in this country, and to suggest the establishment of units where classification *can* be carried out. I refer to an article which you published under my name and that of Crome and Fisher in March, 1939 (LANCET I, 655). In my book I am concerned to suggest not only the establishment of such posts, but to point out that *if* the weather conditions are suitable, and *if* there are not repeated raids, then classification would be better done on the spot than not done at all.

I remain as convinced as ever I was that classification should be arranged for in properly adapted buildings, and I need no assurance that classification is not a simple

procedure, but one which requires proper light, proper surroundings and reasonable safety, if it is to be done in a satisfactory manner. However strong reasons these may be for reasonably protected clearing-stations, the strongest must always remain that men, women and children who have just passed through the frightening experience of being raided and wounded must be taken to places of at least relative safety and not to hospitals which, in some areas, are the chief death traps in the district. (There is no alternative to windows except perhaps obliterating them, but this is no cure for unsafe walls and roofs.) Indeed, it is the entire absence of any appreciation of the necessity for classification or of its essential pre-requisites that forms one of my main criticisms of the existing scheme.

Surgeons who have been operating the scheme in the last few weeks will be able to judge for themselves whether these facilities are or are not present. I suggest that they ask themselves not whether they managed to dispose satisfactorily of their casualties, but whether they would have disposed of them satisfactorily had they been really large in number and that number repeated owing to recurrent raids. Would the most urgent cases have achieved operation at the nearest hospital and the least urgent have gone farther afield, after a period of resuscitation? If the answer is no, then the scheme is at fault, and at fault for lack of facilities for classification for which some of us have been pleading so long.

Let me say that the classification and evacuation *posts* which are advocated are no ideal buildings impossible of realisation. Such buildings exist and have been arranged for their function, even if their staffs have not been made available for them.

In conclusion I would remark that I do not think that the capacity of first-aiders to diagnose such conditions as tension pneumothorax is relevant to the discussion; nevertheless I take leave to be somewhat sceptical. Your reviewer must have met a very superior breed of first-aider!

London. G. B. SHIRLAW.

TRAINING IN ANÆSTHETICS

SIR,—Your leader of Sept. 7 on the advisability of employing nurse anæsthetists invites comment. My views are not coloured by the cares of private practice, and that I have no prejudice against unqualified assistants is shown by the fact that at the outbreak of war I arranged at Oxford a series of 15 lecture demonstrations on the principles of general anæsthesia and the care of the unconscious patient, to which besides medical and dental practitioners were invited nurses and laboratory assistants. I explained to the class that they were not being trained as anæsthetists but as assistants, so that in the event of mass casualties a limited number (say 4 to 6) could do their best under the guidance of an anæsthetist who would pass from table to table giving assistance as required. For large centres this is surely a preferable procedure to training one nurse as an anæsthetist on the understanding that she would be in sole charge.

That it is possible to train an intelligent nurse to become technically good in administering anæsthetics within a limited range is beyond dispute. Equally easy would it be to train a nurse or good motor mechanic to become technically efficient to enucleate tonsils, thyroids, cataracts or teeth. Such a nurse would deal capably with the straightforward cases, but only the specialist proper has a training broad enough to prevent emergencies from arising or to deal with unanticipated complications. It is this insurance that all patients in this country have been led to expect and for which the private patient is willing, indeed keen, to pay.

Your leader states "It will be seen therefore that the choice appears to rest not between a qualified and an unqualified anæsthetist, but between an unqualified anæsthetist and no anæsthetist at all." Surely this is nonsense. If the Cambridge surgeons or Addenbrooke authorities are prepared to make a reasonable opening for a specialist anæsthetist they can have the choice of many within 48 hours, and such a move would greatly benefit the public they serve. Referring to the last war you continue, "Moreover, at least one East Anglian hospital which used nurse-anæsthetists has kept them on ever since." Is there any real reason why during the intervening twenty years the district concerned should not have enjoyed the services of a specialised anæsthetist?

One other point. A small army of osteopaths, chiropractors and other unqualified practitioners are calling out for anæsthetists to help them with their manipulations and other minor operations. Any anæsthetist willing to desert the ranks of the medical profession can at once command a salary of several thousand pounds a year. If the medical profession recognise the status of nurse-anæsthetists this temptation will soon be removed from our frailer brethren.

Oxford. R. R. MACINTOSH.

PARALDEHYDE AS A DEHYDRATOR

SIR,—In pathological section cutting and mounting, the use of paraldehyde will be found to make absolute alcohol and clove oil unnecessary, as the first-named liquid mixes with any dilution of alcohol stronger than 85%, with xylene, with Canada balsam in xylene, and also with hard paraffin at temperatures above its melting point. Although the adjective "microscopical" may perhaps be applied in a double sense to this bit of economy, you may care to publish it as I have never seen it in any book on the technique of mounting. It is equally available for use with Polystyrene, the new water-white mounting medium of somewhat higher refractive index than Canada balsam (see Hatherly, H. M. *Microscope*, April, 1940, p. 136).

Mental Hospital, Wells, Somerset. D. S. SPENCE.

PENICILLIN

SIR,—An annotation in your issue of Aug. 24 suggests (p. 236) the use of penicillin for the isolation of *B. pertussis* in cough plates. I have used this method for the past three years as a routine, and have found it to give excellent results, and to save much labour. In testing its value I employed the method devised for the isolation of *H. influenzæ* by Fleming and Maclean (*Brit. J. exp. Path.* 1930, **11**, 127); 6–8 drops of strong penicillin are spread over one half of the plate and the other half is left untouched; of 50 such cough-plates exposed 47 gave positive cultures of *H. pertussis* on the penicillin side against 33 positive cultures on the untreated side. On several occasions *H. pertussis* was isolated from the penicillin side of the plate when it was not found on the other half, and this was specially so when cultures were taken towards the end of the infected period. Penicillin was useful in another way. Swabs taken from whooping-cough cases only give 10% of positive results because the secondary growth is so great; but if the swabs are treated with penicillin the secondary growth is so much reduced that 75–80% of positive results are obtained. I reported these findings in the *Journal of Pathology and Bacteriology* (1937, **2**, 472).

St. Mary's Hospital, Paddington. I. H. MACLEAN.

TREATMENT OF BURNS

SIR,—I should like to support Mr. Hobson (*Lancet*, Aug. 24) in his appreciation and valuation of aniline dyes in the treatment of war burns, especially where a large number have to be treated. We have found that if the burn is cleaned up with saline and then triple dye is applied without a dressing an excellent coagulum is produced. This coagulum does not tend to crack as is so frequently the case with a tannic-acid tan. As a first-aid treatment a 10% gentian-violet ointment containing Merthiolate put up in tubes has been found to be very efficient and is not so painful in its application as the tannic-acid preparations.

Royal Naval Hospital. CECIL P. G. WAKELEY.

NEGATOL

SIR,—Mr. Lloyd's request for comment on the use of Negatol for vaginal discharges has prompted me to mention a small series of cases which I have treated with encouraging results. I have applied 100% negatol to the cervical canal and the fornices at 3-day intervals for four or five treatments; the gross desquamation is painless and impressive and it is replaced by healthy epithelium. I do not think that the compound is reliable in trichomonas vaginitis, but in the frequent residual

discharges after the sulphonamide treatment of gonorrhœa it has been rapidly effective and cases have remained clear on prolonged observation. I have also used the ointment and the pure solution in chronic varicose ulceration of the leg. The application has caused pain when there has been much œdema, but in other cases healthy granulations have been stimulated and healing has been rapid.

London, W.1. DAVID ERSKINE.

ASCORBIC ACID AS AN INDEX OF NUTRITION

SIR,—The work embodied in the article of Dr. L. J. Harris in your issue of Aug. 31 is worthy of much praise; but the basal idea is open to question. Are we justified in assessing a diet as adequate or good simply because it contains a high amount of ascorbic acid? The band who accompanied Stefansson in his arctic journey enjoyed good health on a diet which contained minimal amounts of vitamin C—i.e., seal and walrus flesh. Scurvy did occur for a time in those members who changed this diet for that found in a cache of a previous expedition. A Labrador missionary doctor told me when a student (before vitamins were discovered) that his treatment for scurvy was prompt and simple; he gave his patients fresh deer or seal flesh, though he had ample lemon and lime juice.

More striking are the experiments of Rietschel, Schick and Mensching (*Klin. Woch.* 1939 1285) who maintained men on diets as free of vitamin C as was possible for long periods, in one case for 160 days. These subjects did strenuous work and suffered no ill health which could be attributed to the "inadequate" diet, although for months no ascorbic acid could be found in urine or in blood. Many of our conceptions of scurvy are gained from experiments on guineapigs; it is far from certain that scurvy in the guineapig is comparable with scurvy in man. It is true that ascorbic acid will cure scurvy both in guineapig and man, but that does not imply that scurvy is caused by an insufficiency of ascorbic acid. Malaria is cured by quinine, but we do not say that malaria is a hypo-quininosis.

It is thus evident that diets adequate for strenuous work and good health may contain very little ascorbic acid. Shall we then continue to make this substance the sole criterion of dietetic adequacy? More reliable, though certainly slower to get, would be tests of the staying power to measured work and immunity from illness on varied diets.

Bristol, 8. A. T. TODD.

A CIRCULATORY STIMULANT

SIR,—Calcium camphosulphonate is a water-soluble preparation that has been used extensively on the Continent. Marfori and Susanna[1] combined it with ephedrine and described its efficacy as a circulatory and respiratory stimulant. I have recently had the opportunity of using this solution clinically, and I have been greatly impressed with the results. It was given subcutaneously and intravenously in acute heart failure and in narcotic poisoning. It improved the rhythm and the force of the heart's action. The increase in blood pressure which resulted was much less transient than with other preparations, and it is likely that it could be given with great advantage before or during spinal anæsthesia.

Calcium camphosulphonate with ephedrine is effective also when given orally, and I have described it in chronic heart conditions. It proved particularly efficacious in postinfluenzal asthenia. Five minims three times a day brought about a marked improvement in the patient's condition within a few days, and in every case convalescence was shortened. I believe that the well-known stimulant action of camphor is made more certain by even distribution and that it is enhanced and reinforced by the tonic action which calcium exerts on the heart.

The calcium camphosulphonate with ephedrine (Camphotone) was prepared for me in the laboratories of Allen and Hanburys Ltd.

French Hospital, W.C.2. S. GALEWSKI.

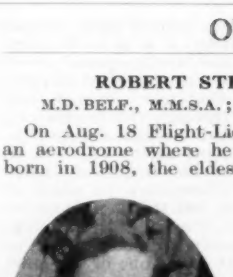
1. Marfori, P. and Susanna, V. *Rass. Terap. Pat. clin.* 1931, 3, 65.

Obituary

ROBERT STEVENSON CROMIE

M.D. BELF., M.M.S.A.; FLIGHT-LIEUTENANT, R.A.F.

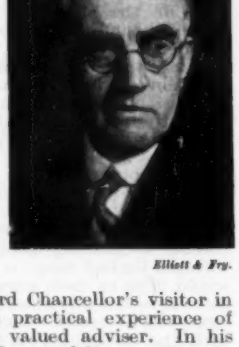
On Aug. 18 Flight-Lieutenant Cromie was killed at an aerodrome where he was medical officer. He was born in 1908, the eldest son of Mr. S. J. Cromie of Ballymoney, and graduated from Queen's University, Belfast, in 1931. After holding house-appointments in Belfast he migrated to London and became clinical assistant at the Royal Chest Hospital. Later he joined a practice in Coulsdon. In 1937 he took his M.D. and the following year obtained the mastership of midwifery of the Society of Apothecaries. He had been attached to the Auxiliary Air Force since 1938 and had qualified as a pilot. When war came he joined the R.A.F. He served some months in France and took part in the evacuation of Dunkirk. Dr. Cromie was also an hon. medical officer of the British Red Cross Society. He leaves a widow and a boy of three. One of his partners writes: Cromie was a striking and charming personality, a good public speaker, a good teller of stories, and above all a very fine man as a partner and friend.



NATHAN RAW

C.M.G., M.D. LOND., M.R.C.P., F.R.S.E., J.P.

Nathan Raw was a man of parts. In his early years he was in charge of one of the largest municipal hospitals in the country and made notable contribution to the classification and treatment of tuberculous cases. During the last war he was in command, with the rank of lieut.-colonel R.A.M.C. (T.), of the Liverpool Merchants' war hospital and later of the First Western General hospital. After the armistice he was appointed C.M.G. and became M.P. for the Wavertree division of Liverpool. Whilst in Parliament he was chairman of the medical members and contributed effectively to the passing of legislation sanctioning the voluntary reception of early cases of mental illness. He also gave evidence before royal commissions on arsenical poisoning, on the care of the feeble-minded and on the function of the Poor Law. On the retirement of Crichton-Browne in 1922 he became Lord Chancellor's visitor in lunacy, in which position his practical experience of mental disorders made him a valued adviser. In his later years he had a general consulting practice in London and had the unusual distinction of presiding over three great professional organisations: the Royal Medico-Psychological Association, the Hunterian Society, and the Tuberculosis Association. He was then consulting physician to the Margaret Street hospital and to Preston Hall colony for ex-service men.



Elliott & Fry.

Nathan Raw was born in 1866 and did his medical studies at Newcastle-on-Tyne, graduating in 1888. The following year he took the certificate in psychological medicine and a few years later the Edinburgh surgical fellowship. At college he had taken many prizes and in 1892 he was Gaskell gold medallist in psychological medicine. After qualifying he held several surgical resident posts and obtained experience in mental disorders at Portsmouth and Kent county asylum. For a time he was medical superintendent of the Dundee

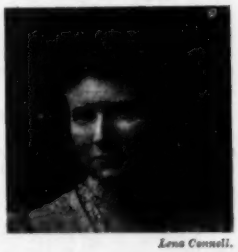
royal infirmary, before taking charge of Mill Road infirmary, Liverpool. There he had the opportunity of observing over 7000 cases of pulmonary and 2200 of non-pulmonary tuberculosis. While he accepted the current view that human and bovine strains of tuberculosis are separate and distinct he was convinced that the bovine strain, introduced during infancy, may undergo mutation into a human strain. His tuberculosis wards at Mill Road were neatly classified into human and bovine and for immunisation he used a human strain which he had attenuated by special culture over a long period. A small monograph published three years ago embodied this part of his experience. In his own laboratory he worked with many other vaccines and during the last war he tried out an autogenous vaccine in pneumoccocal infections. His presidential address to the R.M.P.A. in 1929 was devoted to the study of fear regarded as the driving force of life and he critically analysed the Lange-James theory that fear as an emotion is the sensation of the visceral changes accompanying it. He ended by rejecting the theory and finding the real solution of fear in a defensive mechanism excited by the prospect and realisation of dangers which sets in motion a physical mechanism to defend life. He was always interested in the relation of mental symptoms to bodily disease and their treatment.

Colonel Raw married in 1897 Annie Louisa, daughter of Charles Strong, who died six months ago. They had two sons and a daughter.

EMILY ELIZABETH FLEMMING

M.D. LOND.

ONE of her colleagues has said that Mrs. Flemming, who died on Aug. 12, was one of the meek people in the true sense of the word. She had a wide knowledge of medicine, sound judgment and absolute honesty. But she also had great modesty and she always felt considerable diffidence in expressing her really decided opinions and firmly held principles. Thus though she was deeply religious she never obtruded her views on others, and her influence was real, partly because it was so quiet and natural.



Lena Connell.

Mrs. Flemming was born in 1862. Her father was a barrister of the Inner Temple, and she was educated at the North London School for Girls and later at Girton where she took the natural sciences tripos. She was already eager to become a doctor but want of funds made this impossible and she went to teach science, first at West Heath School, and later at St. Leonard's School, St. Andrews, till a legacy set her free to take up medicine. At the London School of Medicine for Women her ability and character naturally made her the leader of a little group of her fellow students. She went through the medical course as quickly as possible and took her M.B. in 1891 and her M.D. the following year. After qualifying she demonstrated anatomy at the school under Stanley Boyd and held a medical registrarship at the Royal Free. She began her long association with the Elizabeth Garrett Anderson Hospital (then known as the New Hospital for Women) as clinical assistant and soon became pathologist and then physician to out-patients. There she began and developed the children's department, and when she moved up in charge of beds on the medical side she was able to hand over the new venture in a flourishing state. For a time she held a joint lectureship in medicine at the school, but soon resigned for she felt it was unsatisfactory lecturing to medical students who had no opportunity of watching her practical work.

Mrs. Flemming always insisted that she was a general physician and not a women's doctor, and when she gave up her hospital work she continued her consulting practice. Till her death she was also chairman of the medical board of the Zenana mission. She was anxious that women should take their place in the world but she wanted it to be because they were worthy of it. Perhaps her most useful work on their behalf was done when University College Hospital opened its doors to medical women and she acted as a sort of unofficial dean to the newcomers. She never lost her capacity for teaching and her children and grandchildren benefited from it, while her continued interest in education was demonstrated by her work as a medical inspector at St. Felix School, Southwold, and at several London high schools, at a time when the principle of school medical inspection was still on trial.

Mrs. Flemming was married to Mr. Percy Flemming, emeritus professor of ophthalmology at University College, London. They had four children and their second son, Mr. C. W. Flemming, F.R.C.S., is now serving as a wing-commander. Mrs. Flemming was a lover of the country and country ways and she had great skill in gardening. She was a gracious hostess and many of her friends will recall with pleasure their visits to her home.

CHARLES GAME ANGUS CHISLETT

M.B. GLASG., F.R.F.P.S.

Dr. Charles Chislett, physician superintendent of Lennox Castle certified institution, died on Aug. 24 in his 57th year. A native of Lanark, Dr. Chislett was educated at the universities of Glasgow and Edinburgh, and graduated at Glasgow in 1906. He joined the psychiatric staff of Woodilee mental hospital as a junior physician and remained as pathologist and senior assistant. Shortly before the last war broke out he had been appointed physician superintendent to Glasgow corporation's institution for mental defectives at Stoneyetts. He interrupted his work of organisation and development there to serve with the R.A.M.C. as a captain in Salonica and France, where he acted as mental specialist to the B.E.F. After demobilisation he returned to Stoneyetts until 1936 when the corporation appointed him to the newly opened Lennox Castle. J. R. R. writes: Dr. Chislett's opinion was sought as authoritative on the social, administrative, legal and scientific aspects of mental disease. As a distinguished pioneer his name ranks with Sequin, Itard, Esquirol, Conolly and Wilbur. He was a great physician, a great humanitarian and a very great gentleman.

CYRIL RATCLIFFE SANDIFORD

M.D. MANC., F.R.C.S.E.

Mr. Sandiford, who died in London on Aug. 23, was educated at the Victoria University of Manchester where he qualified M.B. in 1916. He joined the R.A.M.C. at once but was invalided out after a term of service suffering from cardiac disease following acute rheumatism, and his capacity for work was always somewhat restricted by this disability. After he left the army Sandiford held appointments as house-surgeon at Manchester Royal Infirmary and at the Devonshire Royal Hospital, Buxton. About this time he began to specialise in otolaryngology and soon he was appointed assistant surgical officer to the ear, nose and throat department at the infirmary. In 1919 he was awarded his M.D. for a thesis on the calcium-content of the blood in otosclerosis, and came to London as house-surgeon to the Golden Square hospital. Later he was appointed registrar at the hospital and in 1925 after obtaining the F.R.C.S.E. he joined the hon. staff as assistant surgeon. He resigned from this appointment in 1931, but continued to hold his posts as surgeon to the ear, nose and throat department of the Queen Mary's Hospital for the East End, and as assistant aural surgeon to the London County Council.

Dr. J. G. FITZGERALD

Sir Wilson Jameson writes: I should like to add a few personal lines to your brief notice last week. I first met FitzGerald in 1929 when I spent some time at the Connaught laboratories and the Toronto school of hygiene. In these two undertakings FitzGerald built for himself a lasting memorial. He was the happiest of directors whether presiding at one of the regular meetings of the scientific staff or representing the laboratories at some international gathering or playing the daily after-luncheon game of deck tennis on the roof of the institute.

Preventive medicine had no more ardent or skilled advocate. FitzGerald was no mere administrative official. He was a laboratory worker of repute whose experience had convinced him that prevention of disease was likely to become more and more possible as the years went by. He put his ideas into practice first in the Connaught laboratories and the school of hygiene and then in the undergraduate course of study in the University of Toronto. The Toronto school of public health nursing owes much to his encouragement, and the fact that Canada has probably the best Government-controlled scheme for the preparation and distribution of biological products is largely due to FitzGerald. He was a delightful companion (I once travelled with him for three months)—always cheerful, the possessor of a keen sense of humour and of a highly developed critical faculty. On his many journeys he was always on the look-out for talented youngsters and many a young man has to thank him for his first real start in life. He had friends all over the world; they will feel his death as a great personal loss—the younger perhaps even more than the older, for FitzGerald was himself a boy at heart.

Parliament

WHEN the House of Commons reassembled on Sept. 5 after their brief recess members were full of eager expectancy in regard to the speech which it had been announced the Prime Minister would make on the progress of the war. In striking contrast to the flamboyant rhetoric indulged in by Herr Hitler a night or two before, Mr. Churchill's message was temperate and even cautious in its phrasing. But throughout there was a healthy note of confidence that whatever the difficulties ahead we are fully prepared to meet and overcome them. Everyone was pleased to learn that the criticisms in the press and elsewhere of the needlessly alarming air-raid sirens have not fallen on stony ground. Mr. Churchill greatly pleased the House by his frank admission that there was no sense in sounding those "prolonged banshee howlings" two or three times a day over wide areas. The question has been referred to a departmental inquiry. Curiously enough the House of Commons had practical experience of the sounding of an air-raid alarm just before Mr. Churchill was due to speak. Members were obviously disinclined to interrupt the sitting, and the Speaker announced that he would not declare the House adjourned unless there was a warning of danger. A little later such a warning was received and the House adjourned for a time.

Mr. Churchill gave some interesting casualty figures based on recent experience of air attack. During August, he said, 1075 civilians had been killed, and rather more had been seriously injured. While sympathy naturally must be extended to the wounded and bereaved, it could not be pretended that out of a population of 45,000,000 these casualties, even multiplied as they might be, two or three times, would be serious compared with the majestic issues at stake in this war. Houses actually damaged beyond repair in August were 800 out of a total of 13,000,000.

There was general satisfaction at the Prime Minister's announcement that the Chancellor of the Exchequer was considering the possibility of a more generous insurance scheme against air-raid damage to property. In addition, he said, it was proposed to abolish the upper limits of £50 and £30 for compensation to persons of limited means for damaged furniture and clothing, and to enable payment to be made up to 100% of the damage. Further help was also promised for coast towns. Another matter of some interest from a public-health point of view was Mr. Churchill's assurance that an expert committee was considering whether there could safely be more light and cheer during the coming winter. As regards invasion, that was still a possibility which had to be faced in a spirit of constant vigilance.

Both Houses of Parliament have now adjourned until Sept. 17. The Prime Minister said that on that date the scheme for the physical recreation of young people would be debated while on the following day the health of the nation, with special reference to national health insurance, will be the principal subject of discussion.

Medical News

University of Leeds

The first of the lectures endowed by the late Lord Moynihan in memory of his mother will be delivered on Wednesday, Oct. 2, at the university union by Surgeon Rear-Admiral G. Gordon-Taylor. His subject will be The Moynihan Tradition.

Society for the Study of Inebriety

Sir Arthur Hurst will deliver the eighteenth Norman Kerr lecture to this society on Tuesday, Oct. 8, at 4 P.M., in Friends House, Euston Road, London, N.W.1. He will speak on alcohol and the organs of digestion.

American Vans for Blood Transfusion

The Medical Research Council have received four motor vehicles, specially equipped for medical work, from the United States. These were originally purchased by the American Quakers and the International Commission for the Assistance of Child Refugees for use in France. The vehicles are to be used principally in the work of the Emergency Blood Supply depôts in the neighbourhood of London.

Naval Honours

The distinguished service cross has been awarded to Probationary Temp. Surgeon Lieutenant G. H. Swapp, M.B. Aberd., R.N.V.R., H.M.S. *Sycamore*.

Extra Rations for Invalids

In June Mr. Robert Boothby said in the House of Commons that the food rationing (special diets) committee of the Medical Research Council had recommended extra rations for people with spontaneous hypoglycæmia or steatorrhœa. The necessary arrangements have now been made. Sufferers from spontaneous hypoglycæmia will be allowed two extra rations of sugar per week and sufferers from steatorrhœa (cœliac disease, cœliac infantilism and tropical sprue) three extra rations of meat per week in exchange for their butter ration. Diabetics are allowed one extra ration of meat and two extra rations of butter per week in exchange for their sugar ration. Applications must be supported by a medical certificate and should be made to the local food office.

Appointments

CAMERON, F. P., M.D. Manitoba: R.S.O., Warwick Hospital.
MURPHY, J. T., M.B. Belf., D.P.H.: asst. County M.O. and District M.O.H. for Northampton.
NIALL, SHEILA M. M., L.M.S.S.A.: asst. M.O.H. and asst. School M.O. for Chatham.
ROBINSON, G. E., M.B. Sheff., D.O.M.S.: ophthalmic clinical assistant at the Royal Infirmary, Sheffield.
SMITHSON, D. G., M.B. Leeds, D.P.H.: asst. M.O.H. for Swindon.
SOUTH, CYRIL, M.B. Sheff.: surgical first assistant at the Royal Infirmary, Sheffield.
WHITE, T. H., M.B. Brist.: M.O., Tanganyika Territory.
Examining surgeons under the Factories Act, 1937: C. F. COPE (Andover, Southampton); and J. AGNEW (East Kilbride, Lanark).

Births, Marriages and Deaths

BIRTHS

DREW.—On Aug. 30, at Belfast, the wife of Captain J. M. M. Drew, I.M.S.—a daughter.
GREENE.—On Sept. 7, at Oxford, the wife of Dr. Raymond Greene—a daughter.
HAMBLY.—On Sept. 8, at Seer Green, Bucks, the wife of Mr. Edmund Hambly, F.R.C.S.—a daughter.
SMART.—On Sept. 5, at Bromley, the wife of Joseph Smart—a daughter.
TAYLOR.—On Sept. 6, at Dorking, the wife of Surgeon Lieut.-Commander W. B. Taylor, R.N.—a daughter.

MARRIAGES

JONES—STERRY-COOPER.—On Aug. 29, at Elmbridge, Lionel Evan Jones, M.S., to Dorothy Mary Sterry-Cooper, M.B.
STENHOUSE—ELWELL.—On Aug. 31, at Lewes, Ralph Alan Stenhouse, Surgeon-Lieutenant R.N., to Geraldine Truth Dudley Elwell.

DEATHS

CARLIER.—On Sept. 2, at Dorridge, Edmond William Wace Carlier, M.D. Edin., M.Sc. Birm., F.R.S.E., F.R.E.S., in his 79th year.
HEELIS.—On Sept. 7, Robert Heelis, M.D. Durh., of Nottingham.
WINDLE.—On Sept. 6, at Bournemouth, Reginald Joscelyn Windle, M.B. Dubl., Colonel R.A.M.C. (retd.), aged 80.
WINGATE.—On Sept. 3, in London, Basil Fenton Wingate, D.S.O., M.R.C.S., Colonel R.A.M.C. (retd.), aged 65.

Notes, Comments and Abstracts

THYMOL AS AN ANTHELMINTHIC

By CLAYTON LANE, M.D. Lond.
LIEUT.-COL. I.M.S. (RETD.)

FIVE years ago I wrote "There is so much of human life and human happiness at stake that the immediate future should see a serious effort made, by unprejudiced and independent medical workers, to add to acceptable and controlled evidence regarding the real value and safety of hookworm-killing drugs" (Lane 1935). Maplestone and Mukerji, writing from the School of Tropical Medicine, Calcutta, where both necators and ancylostomes are met with, have since, in self-imposed limiting conditions, treated three series of patients, each numbering 25, with thymol, with tetrachlorethylene and with tetrachlorethylene combined with oil of chenopodium; and they have put tetrachlorethylene in the first place on grounds of safety, efficiency, cheapness and ease of administration.

Tetrachlorethylene.—These writers, after experiments on cats (1934) and many years practical experience in treatment of man, give tetrachlorethylene in dosage of 4 c.cm. After experiments on 116 animals of varying species, Lamson, Robbins and Ward (1929) wrote of tetrachlorethylene, "The degree of absorption varies greatly with the species." What is the evidence that experiments on cats may confidently be transferred to man? In determining the safety of anthelminthics in man it is numbers of treatments that matter (Maurice Hall advised 100,000) and not the years over which a series was spread. Maplestone and Mukerji (1929) treated 28 persons with 3 c.cm. of this drug in soft capsules with a cure rate of 16·7%. Some years later they came on a stored box of these capsules collapsed and empty, and suggested (1937) that evaporation had already begun before they used them in their test. But they could have noticed nothing amiss with these soft capsules during their test and indeed they reported the actual giving of 3 c.cm. of the drug from opened capsules. Even if they merely concluded that these still contained the full amount of the drug they are faced with Ashford's opinion, which they clearly value highly, that its dose should not exceed 2 or 3 c.cm.; the capsules could hardly have lost a third of their contents without obvious shrinkage and if they had not lost so much their contents would have been within his advised dosage. In the same paper (1937) they reported on 81 persons whom they were able to follow up after giving them 4 c.cm. of the drug; there was a cure of 61·7%, near cure bringing the figure up to 75·3%. In 1940, again using an adult dose of 4 c.cm., they cured 36% of 25 patients (near cures bring the percentage to 88) and brought away 99·1% of the total bag of necators and 96·1% of that of ancylostomes. Do these small numbers give significant results? They seem significantly different.

Tetrachlorethylene and oil of chenopodium.—When, to their adopted dose of 4 c.cm. of tetrachlorethylene, Maplestone and Mukerji (1940) added 1 c.cm. of oil of chenopodium of B.P. strength, they reduced worm removals. These were only 38·3% in place of 99·1% with tetrachlorethylene for necators, and 23·9% in place of 96·1% for ancylostomes. In 1933 this dosage had unwormed 62% of 50 patients in one treatment. In the 25 patients reported in 1940 the rate was 48%. The figures are discrepant; and two proved anthelminthic drugs taken together gave poorer results than one taken alone.

Thymol.—The widely accepted dose of thymol is gr. 60 (4 g.). In no case did Maplestone and Mukerji give as much, saying that they had not reduced the dose to decry its value but that they were guided by Ashford's widely based opinion (to which they give no reference) that for safety the dose of thymol must be carefully regulated, and they were dealing with underweight adults. Just before his death Ashford summed up his great experience of thymol by saying (1933) that the adult dose was 4 g. but was frequently lowered for women. He added, first, that after the administration of over a million doses without fatalities in the days when rum, a solvent of thymol, was plentiful, he had lost almost all fear of thymol; and secondly, that while in safety thymol seemed superior to all other efficient anthelminthics, in efficacy it was distinctly inferior to oil of chenopodium, carbon tetrachloride and tetrachlorethylene, the last in dosage not exceeding 2 to 3 c.cm.—a view hardly borne out by the conclusions of Maplestone and Mukerji themselves.

When I analysed (1929) all reports on deaths after thymol that I could trace I noted that the lesions and symptoms differed in all with the exception of two brothers who died after an excursion together into the woods; such deaths can hardly have been due directly to thymol. This and my experience of 50,000 treatments of Indians in their homes without anxiety, in a normal adult male dose of gr. 60, suggests that there could have been found in Calcutta 25 Indian patients to whom could be given in hospital without undue anxiety the full dose that has been taken without a death in such great numbers elsewhere. Further, after two such treatments to Maplestone and Mukerji's 25 patients, 80·5% of the total collection of necators was got away, while for ancylostomes the figure was 0·2% (3 of 1328). In Egypt, where ancylostomes seem to be the only form of hookworm reported, thymol has been widely given and esteemed. A drug which at this cure-rate would need 500 treatments for unworming could not have held for so many years the repute that thymol did in Egypt and elsewhere.

DISCUSSION

The millions of doses of thymol that have been given are a measure of its risk. As to anthelminthic value Maplestone and Mukerji have reported on some hundreds with tetrachlorethylene. Their discrepant results do not lead to the conclusion that these hold generally.

Unfortunately the matter cannot rest there. In its review of Conybeare's "Textbook of Medical Treatment" the *Indian Medical Gazette* (1939, **74**, 638) says: "The chapter on tropical diseases is left in the experienced hands of Dr. Greig. Most of the treatment he advocates is sound and up to date, an exception being that he gives preference to thymol in the treatment of ankylostomiasis, for the very poor reason that a particular worker who has had considerable experience in the treatment of this infection considers it the best treatment. He does not mention that this particular worker retired from the tropics 20 years ago and has obstinately refused to see that since his day, more effective, more safely administered and cheaper drugs have been introduced." Is it suggested that personal experience with each anthelminthic drug is necessary for right conclusions as to the grading of them all? For over ten years it has been my duty to read all that is written all over the world on helminthic and anthelminthic matters, in a singularly complete collection made by the staff of the Bureau of Tropical Diseases. Further, when I collected the cited evidence for the value of hookworm-killing drugs I did so with an open mind, and was surprised that on it I still had to put thymol first. I think there was, and still is, reasonable evidence that the drug's position is where Ashford put it—that it is the safest of all efficient anthelminthics.

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MODERN ANÆSTHESIA

IN his Honyman Gillespie lecture in Edinburgh last week Dr. John Gillies described some of the changes in anæsthetic practice which have taken place since the last war, at the end of which a vigorous fight was still going on between the supporters of chloroform and of ether, with nitrous oxide and oxygen just fighting for recognition. Ether won that struggle on account of its lower toxicity. But now still less toxic drugs are coming forward—cyclopropane, ethylene and divinyl ether. A mixture of nitrous oxide and oxygen with ether is perhaps the favourite anæsthetic, partly but not wholly on

account of its cheapness. Ethylene, which has now been used for some years, has a higher specific anæsthetic value than nitrous oxide because of its greater lipoid solubility, but cyclopropane is ousting it. Cyclopropane has the advantage of being used with a high concentration of oxygen—15% of cyclopropane to 85% of oxygen—whereas with nitrous oxide the proportions are reversed. Though expensive in bulk, so little is used with modern apparatus that the cost per operation is low. It is inflammable and explosive and must be used carefully in the presence of the cautery; the danger is lessened by using the closed-circuit method. It is suitable for patients of all ages. A great advance has also taken place in premedication; formerly atropine alone was given, but atropine raises the threshold of anæsthesia. Today the purpose of premedication is to lower the metabolic rate and the threshold of anæsthesia by diminishing emotional excitement. Morphine and hyoscine are satisfactory, and should be given in the proportion morphine 25: hyoscine 1. Avertin per rectum is widely used especially for nervous patients; Luminal gr. ¼ per stone of body-weight is also useful. Endotracheal administration is becoming more popular, especially now that a satisfactorily wide tube can be passed into the larynx without a direct-vision laryngoscope. It enables the face to be completely covered with sterile towels, which has obvious advantages in operations on the head and neck. The closed-circuit method enables a uniform level of anæsthesia to be maintained with a minimum expenditure of anæsthetic—nitrous oxide, ether or cyclopropane. Experience is necessary in giving intravenous anæsthetics, of which pentothal sodium is perhaps the most satisfactory. Drugs of this type probably should not be used with sulphanilamide; and they are also expensive. Respiratory depression can be counteracted by picrotoxin. For continued anæsthesia by this method the intravenous drip can be used. The technique of spinal anæsthesia is more easily acquired than that of inhalation or intravenous anæsthesia. Dr. Gillies believes that procaine and Neocaine are the most satisfactory spinal anæsthetics, and that they can be used with advantage with very light nitrous oxide or cyclopropane anæsthesia. So far in this war burns and lacerated wounds have been common, and in these the anæsthetic must not increase the shock. Regional nerve-block is valuable, but spinal anæsthesia may cause a dangerous fall in blood-pressure, and should not be used unless the systolic pressure is above 100 mm. Hg and shock very slight. For casualty work the anæsthetic of choice is nitrous oxide and oxygen or cyclopropane; and Dr. Gillies advised that chloroform and ether should be avoided as far as possible.

THE INFLEXIBLE CHEESE-MAKER

IT is always a little humbling to realise what a vast body of technical knowledge goes to supply our everyday wants. Our shoes, our ships, and even our sealing-wax, only come our way because in each case a large quiet body of people is fantastically expert about detail. Cheese is a mundane enough substance, one of the oldest forms of food, but it still has its secrets and busy students labour to hunt them out. At the National Institute for Research in Dairying (Annual Report, 1939) they have been conducting psycho-physical investigations to find out what makes the skilled cheese-maker so good at his job. It seems that cheese-makers, in the exercise of their craft, squeeze their cheeses—a sport which has had practical uses ever since Jack the Giant Killer turned it to good account. The cheese-maker, when he squeezes, is attempting to form a judgment on the quality of the cheese, and that judgment is probably based, among other things, on its firmness, springiness or elasticity. Mr. G. W. Scott Blair, Ph.D., and Miss Valda Coppen of the chemistry department of the institute, have reported experiments [1] in which various people—some of them cheese-makers and some not—were asked to form judgments on the firmness and elasticity, not of cheeses, but of substances in which these qualities could be exactly measured. The investigators would have liked to use cheese for the experiments but cheese, as they point out, changes its physical properties too rapidly and "it is not easy to obtain homogeneous samples of any size." They had to devise an ingenious material made up from rubber solution, vaseline and plasticine, and the cheese-makers—all except one—pointed out that this was not at all the same thing as cheese.

Twenty people were chosen to compare the firmness of 8 samples of this synthetic material on a number of different days. They were asked to put the samples on the bench in order of firmness using any method they liked, short of tearing them in pieces. The caution may have been necessary; the observers had found already that after about six tests subjects began to show signs of boredom. Their results are pleasantly unexpected; in the early stages of the experiment the trained cheese-makers were slightly superior to the rest but as time went on they became inferior. Routine analytical chemists, inexperienced in this type of testing, were very good at it and quickly excelled the cheese-makers. Other types of scientific training did not seem to influence either the success of the subject, his learning power or the consistency of his results; nor did sex. Only one of the cheese-makers approached the experiment in anything like a scientific spirit; she expected her previous experience to help her and it did; her powers of testing improved during the experiment. The investigators attribute the failure of most cheese-makers to hold their own in the experiment to their mental attitude. In the early stages the novelty of the tests and an open mind helped them to get good results, but later the apparent purposelessness of the experiment caused them to lose interest, especially as the whole thing seemed to them to have been copied, and badly copied at that, from their usual purposeful activities. Dr. Scott Blair and his colleague found that "however much the expert may be urged to base his judgments of cheese on the results of handling alone, he invariably finds great difficulty in keeping these judgments distinct from those derived from other senses." And who can blame him? It is rather like asking a doctor to base his opinion of the patient on the results of using a stethoscope alone. The cheese-maker uses his eyes and nose as well as his hands and, being strictly practical, cannot see the point of analysing one sensation apart from the others. Yet to evaluate even one of the unconscious observations which form the basis of skilled judgment is instructive. Psychology badly needs a foundation of accurate experimental work of this kind.

1. *Proc. roy. Soc.* B. 1939, **128**, 109; and *Brit. J. Psychol.* July, 1940, p. 61.

THE MYSTERY OF GOUT

GOUT still attacks a few distinguished personages but it is not as common as it was and even uric acid has lost its force as a seller of patent medicines. Nevertheless the disease is still with us and there is plenty of work yet to be done on its ætiology and cure. K. Brochner-Mortensen (*Medicine*, May, 1940, p. 161) has performed a useful service in reviewing what is known of the concentration of uric acid in the blood and its excretion in the urine. On reading his article one cannot help being struck by the fact that, as so often happens, advances in knowledge of this subject have originated either from an improved analytical technique or from some discovery in an adjacent field of science. Thus the article traces out the way in which our knowledge of the concentration and variations of uric acid in the blood have become more and more exact as methods for its determination have become more perfect; and how the study of its excretion has profited from all the work which has been done in the last twenty years on other functions of the kidney. The article is informative, easily written and well documented, but it reveals our lamentable ignorance of uric-acid metabolism. The cause of gout remains one of the unsolved mysteries of medicine. One cannot help wondering whether the problem will be solved by a doctor, a colloid chemist or an accident. Possibly all three may have to collaborate.

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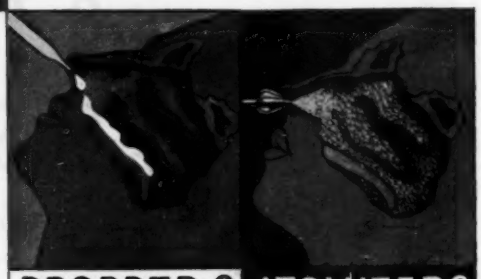

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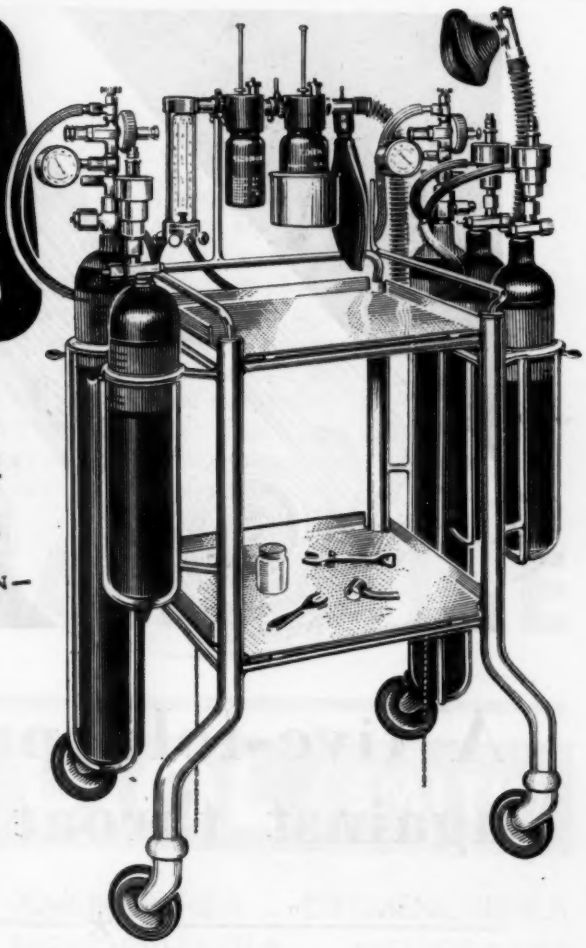

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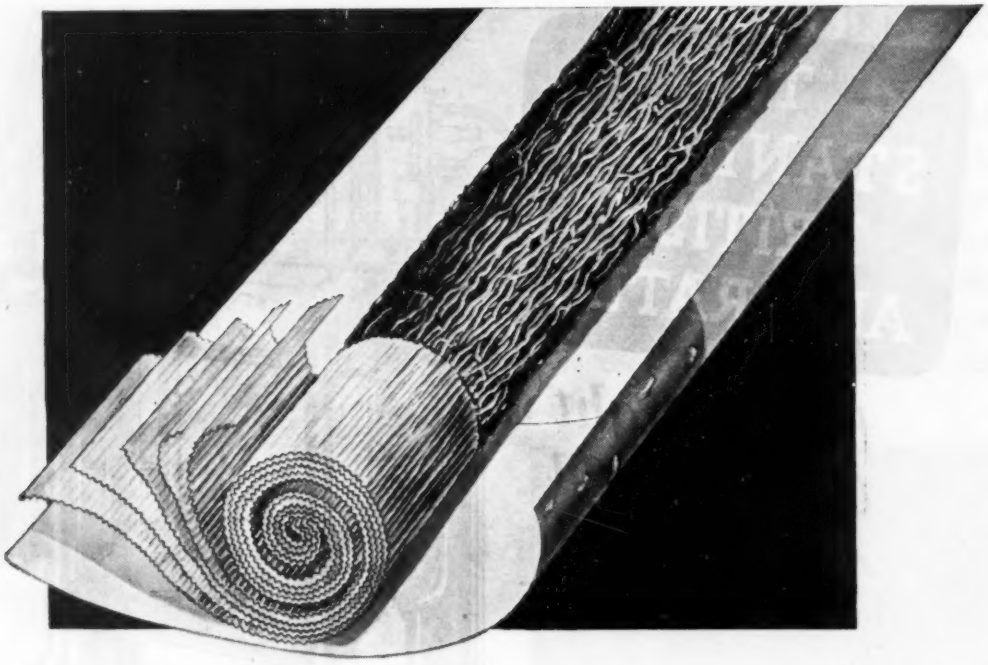

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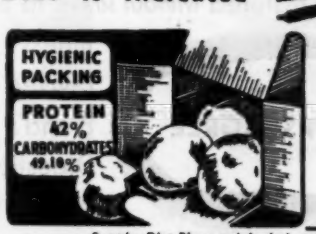

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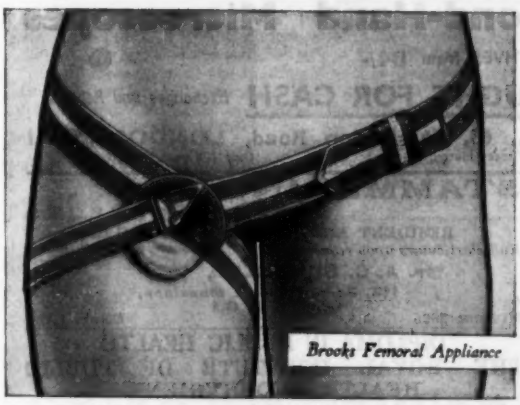

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MONDAY, SEPTEMBER 16TH.

10–11.30 a.m.	Effort Syndrome.	Dr. P. H. Wood, M.B., B.S., F.R.C.P.
11.30–1 p.m.	The Prevention in Barracks and the Field of Certain War-time Diseases of Special Military Importance.	Lieut.-Col. A. E. Richmond, O.B.E., R.A.M.C.
1.30–3 p.m.	Dyspepsia in War.	Dr. C. E. Newman, M.D., F.R.C.P., and Mr. Reginald Payne, M.S., F.R.C.S.
3–4 p.m.	Prescribing in Wartime.	Dr. P. Hamill, D.Sc., M.D., F.R.C.P.

TUESDAY, SEPTEMBER 17TH.

10–11.30 a.m.	Skin Diseases in Wartime.	Dr. R. T. Brain, M.D., F.R.C.P.
11.30–1 p.m.	The Prevention in Barracks and the Field of Certain War-time Diseases of Special Military Importance.	Lieut.-Col. A. E. Richmond, O.B.E., R.A.M.C.
1.30–3 p.m.	Protective Inoculation, with special reference to Tetanus.	Dr. P. Hartley, C.B.E., D.Sc., F.R.S.
3–4 p.m.	Bilharzia Infections.	Dr. P. Manson-Bahr, C.M.G., D.S.O., M.D., F.R.C.P.

WEDNESDAY, SEPTEMBER 18TH.

10–11.30 a.m.	Dietetic Deficiencies in War.	Prof. S. J. Cowell, F.R.C.P.
11.30–1 p.m.	Malaria.	Lieut.-Col. J. A. Sinton, V.C., O.B.E., D.Sc.
1.30–3 p.m.	Treatment of Gas Casualties.	Prof. J. A. Nixon, C.M.G., M.D., F.R.C.P.
3–4 p.m.	Diagnosis and Treatment of Tetanus.	Lieut.-Col. L. Cole, M.D., F.R.C.P.

THURSDAY, SEPTEMBER 19TH.

10–11.30 a.m.	War Neuroses.	Dr. Gordon Holmes, C.M.G., C.B.E., Sc.D., F.R.C.P., F.R.S.
11.30–1 p.m.	Dysentery and Diarrhœa.	Dr. P. Manson-Bahr, C.M.G., D.S.O., M.D., F.R.C.P.
1.30–3 p.m.	Medical Aspects of Head Injuries.	Dr. Russell Brain, D.M., F.R.C.P.
3–4 p.m.	Food Poisoning.	Sir William Savage, M.D.

FRIDAY, SEPTEMBER 20TH.

10–11.30 a.m.	War Neuroses.	Dr. B. Hart, M.D., F.R.C.P.
11.30–1 p.m.	Sulphonamide Drugs in War.	Col. L. E. H. Whitby, C.V.O., M.C., M.D., F.R.C.P.
1.30–3 p.m.	Effects of Blast.	Dr. S. Zuckerman, M.A., D.Sc.
3–4 p.m.	Practical Management of Wound Shock.	Dr. J. McMichael, M.D., F.R.C.P., F.R.S.E.

The fee for the course will be £1 1s., but no fee will be charged in the case of Officers of the Armed Forces and Emergency Medical Service who submit a leave certificate and register their names before the commencement of the course. Applications for tickets should be addressed to the Dean, British Postgraduate Medical School, Ducane Road, W.12.

A Course of Lectures on MISCELLANEOUS WAR SURGERY will commence on SEPTEMBER 30TH, 1940.

DEPARTMENT OF PATHOLOGY

A Course of Instruction for the DIPLOMA IN CLINICAL PATHOLOGY will commence in OCTOBER, 1940. A detailed programme will be published nearer the date. Further particulars may be obtained from the Dean, British Postgraduate Medical School, Ducane Road, London, W.12.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

(UNIVERSITY OF LONDON)

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The course given at the London School is designed primarily to prepare qualified medical practitioners for the examination of the Conjoint Board for the Diploma in Tropical Medicine and Hygiene, but members of the class may qualify for a School Certificate in Tropical Medicine and Hygiene at the end of four months.

The fee for the course is £40.

Arrangements can be made for admission of students to certain parts of the course separately. The fee for these short periods of instruction is 2 guineas per week.

Further information regarding the London Course may be obtained from the Secretary, London School of Hygiene and Tropical Medicine, Keppel-street (Gower-street), W.C.1. (MUSeum 3041.)

British Postgraduate Medical School.

(UNIVERSITY OF LONDON.)

DIPLOMA IN CLINICAL PATHOLOGY.

A Course of Instruction for the Diploma in Clinical Pathology will commence on the first Monday in October. The course will occupy twelve calendar months and the fee will be forty guineas.

Further particulars may be obtained from the Dean, British Postgraduate Medical School, Ducane-road, London, W.12.

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The Organisation of the London Hospital has been adapted to war conditions. The Hospital is now maintaining 500 beds; 350 beds are in use for ordinary patients, and a large proportion of urgent and acute cases are being admitted. 150 beds are reserved for Service sick and air-raid casualties and all Out-patient Clinics and the Maternity District are in full operation almost at their pre-war level. Other patients are transferred to the outlying hospitals in Sectors I and II, **for which the London Hospital is now responsible**; the clinical facilities of these Hospitals are open to London Hospital Students.

The Pre-Clinical School, with staff and equipment, has been temporarily transferred to Cambridge. The teaching of Chemistry, Physics, and Biology for the First M.B. Examination is undertaken by Queen Mary College, with which the London Hospital Medical College is associated. Queen Mary College is also temporarily transferred to Cambridge, and therefore the full pre-clinical curriculum is provided for students in Cambridge.

Entrance Scholarships and Prizes to the value of £950 are awarded annually. Research Funds to the value of £113,000 permit of assistance being given to students and graduates engaged in medical research.

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Further details may be obtained from the Dean, Dr. A. E. Clark-Kennedy, M.D., F.R.C.P., Physician to the Hospital and Fellow of Corpus Christi College, Cambridge, who is always pleased to meet students wishing to see the Hospital and College, and to whom application for admission should be made.

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A Registered Hospital for the Treatment of MENTAL DISORDERS of the EDUCATED CLASSES. Founded by THOMAS HOLLOWAY in 1885.

This Institution is situated in a beautiful and healthy locality within easy reach of London. It is fitted with every comfort. Patients can have Private Bedrooms and Special Nurses as well as the use of General Sitting Rooms, at moderate rates of payment. Voluntary Patients can be admitted.

There is a Branch Establishment at CANFORD CLIFFS, BOURNEMOUTH, where Patients can be sent for a change and be provided with all the comforts of a well-appointed home.

For Terms, apply to—

The RESIDENT MEDICAL SUPERINTENDENT, St. Ann's Heath, Virginia Water, SURREY

THE OLD MANOR SALISBURY

A Private Hospital for the Care and Treatment of those of both sexes suffering from MENTAL DISORDERS.

Extensive grounds. Detached Villas. Chapel. Garden and Dairy Produce from own farm. Terms very moderate.
CONVALESCENT HOME AT BOURNEMOUTH Detached Villas standing in 12 acres of ornamental grounds, with tennis courts, etc., which Voluntary, Temporary or Certified Patients may visit by arrangement for long or short period.
Illustrated Brochure on application to the Medical Superintendent. The Old Manor, Salisbury. Telephone: Salisbury 3216 and 3217.

PECKHAM HOUSE, 112, Peckham Road, London, S.E.15

Telegrams: "Alleviated, London" **Telephone: Rodney 2641-2642**

A Private Mental Hospital, for Ladies and Gentlemen suffering from Nervous and Mental Illness, where the amenities of a comfortable home are combined with full investigation and every well-established modern treatment.

Terms from 3½ guineas weekly.

Illustrated Prospectus may be obtained from the Physician Superintendent.

VALE OF CLWYD SANATORIUM

This Sanatorium is established for the treatment of Tuberculosis of the Lungs and the Pleural Cavities. It is situated in the midst of a large area of park-land at a height of 450 feet above sea-level, on the South West slopes of mountains rising to over 1800 feet, which protect it from north and east winds and provide many miles of graduated walks with magnificent views. Average rainfall 29·57 per annum. Full day and night Nursing Staffs. X-Ray plant. Every facility for Artificial Pneumothorax and for operations on the chest. Electric Lighting. Central Heating. Home Farm. Grade A Milk from T.T. Herd.
For particulars apply to Medical Superintendent.
H. MORRISTON DAVIES, M.D., M.Ch. (Cantab.), F.R.C.S., Llanbedr Hall, Ruthin, N. Wales.

BROOKE HOUSE, CLAPTON

A PRIVATE HOME for the treatment of Nervous and Mental Disorders in both sexes. Situated in nine acres of Pleasure Grounds.
Voluntary, Temporary, and Certified Patients received.
For further particulars apply—
Dr. ERNEST ROLLINS, Resident Physician.
Tel.: Amherst 1642.

THE COPPICE, NOTTINGHAM.

HOSPITAL FOR MENTAL DISEASES.
President: The Right Hon. LORD BELPER.

This Institution is exclusively for the reception of a limited number of PRIVATE PATIENTS of both sexes, of the UPPER and MIDDLE CLASSES, at moderate rates of payment. It is beautifully situated in its own grounds, on an eminence a short distance from Nottingham, and commands an extensive view of the surrounding country; and from its singularly healthy position and comfortable arrangements affords every facility for the relief and cure of those mentally afflicted. Voluntary and Temporary Patients received. Occupational Therapy. For terms, &c., apply to the Medical Superintendent.
Telephone: 64117 Nottingham.

FENSTANTON, at "FIVE DIAMONDS," Chalfont St. Giles, Bucks.

A Private Home for the Care and Treatment of a limited number of LADIES with Mental and Nervous Disorders Certified, Voluntary, and Temporary Patients received. Mansion with 12 acres of ground. (*See Medical Directory*, p. 2346.) Apply Resident Physician. Telephone: Little Chalfont 2046. Station: Chalfont and Latimer.

CITY OF LONDON MENTAL HOSPITAL

Near DARTFORD, KENT.

Ladies and Gentlemen received for treatment under certificates, and without certificates as either VOLUNTARY or TEMPORARY PATIENTS, at a weekly fee of £2 9s., and upwards.

MALLING PLACE, KENT

For LADIES and GENTLEMEN of Unsound Mind.
Terms moderate. Apply to Resident Medical Superintendent.
Telegrams: ADAM WEST MALLING. Telephone No. 2: MALLING.

PORTSMOUTH CITY MENTAL HOSPITAL

Accommodation is provided for the reception of PRIVATE PATIENTS of both sexes in three detached Villas, which are healthily and pleasantly situated in extensive grounds with sea views.

Charges from 3 guineas weekly, including all necessaries except clothing.—Apply to the Medical Superintendent and Resident Physician, THOMAS BEATON, O.B.E., M.D., F.R.C.P.

HEIGHAM HALL, NORWICH

PRIVATE MENTAL HOME for Nervous and Mental illness. All forms of treatment available. Fees from 4 gns. per week upwards according to requirements. Vacancies occasionally exist at reduced fees on the recommendation of the patient's own physician.

Apply to Dr. J. A. SMALL. Telephone: Norwich 80.

UNIVERSITY EXAMINATION POSTAL INSTITUTION

17, RED LION SQUARE, LONDON, W.C.1

Over 50 years' experience

POSTAL AND ORAL COACHING

FOR

ALL MEDICAL EXAMINATIONS

MEDICAL PROSPECTUS (36 pages),

sent gratis, along with List of Tutors, &c., on application to the Principal, 17, Red Lion-square, London, W.C.1. (Telephone: HOLborn 6313.)

Hampstead General Hospital,

Haverstock Hill, N.W.3.

OUT-PATIENT DEPARTMENT, Camden Town, N.W.1.

Applications are invited from registered Single Medical Women for the resident appointment of CASUALTY SURGICAL OFFICER for six months, vacant immediately, at the Out-patient Department, Camden Town. Salary £100 per annum, plus an allowance of £50 per annum for duties in connexion with the First-aid Post established there.

Applications, with copies of three testimonials, to be returned forthwith to the undersigned.

KENNETH A. F. MILES, Secretary.

King Edward Memorial Hospital,

Mattock-lane, Ealing, W.13.

Applications are invited from registered Medical Practitioners (Male) for the appointment of CASUALTY OFFICER AND HOUSE SURGEON (A) (Casualty duties and House Surgeon for Ear, Nose, and Throat, Dental, and Gynæcology) to become vacant this month, including R Practitioners within three months of qualification. The appointment will be for a period of six months. Salary at the rate of £150 per annum, with usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of two recent testimonials, should be sent to the undersigned as soon as possible.

R. A. MICKELWRIGHT, House Governor.

2nd September, 1940.

Metropolitan Hospital, London, E.8.

APPOINTMENT OF HOUSE PHYSICIAN (A).

Applications are invited from registered Medical Practitioners, Male, for the appointment of a House Physician (A) to become vacant on the 1st October, 1940, including R Practitioners within three months of qualification. If held by an R Practitioner appointment will be for a period of six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned at once.

FRANK JENNINGS, House Governor and Secretary.

London County Council.

Medical Practitioners required for undermentioned positions in Council's general and special hospitals. Married quarters not available.

TEMPORARY ASSISTANT MEDICAL OFFICERS (Class I), B1—£350–£25–£425. Suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply. Duties: (*a*) Surgical, (*b*) General.

TEMPORARY ASSISTANT MEDICAL OFFICERS (Class II), B2—Salary £250. R Practitioners who hold A posts may apply. If held by an R Practitioner the appointment will be limited to six months. Duties: (*a*) General, (*b*) Obstetrics.

All positions are with board, lodging, and washing.

Application forms obtainable (stamped addressed foolscap envelope necessary) from Medical Officer of Health, Staff Division 2, County Hall, S.E.1, returnable by 30th September. Canvassing disqualifies.

London County Council.

ASSISTANT PHYSICIST (temporary) required at HAMMERSMITH HOSPITAL, Ducane-road, W.12, for duties mainly in connexion with X-ray work.

£450–£25–£600 a year (no emoluments).

Particulars and form (stamped addressed foolscap envelope necessary) from Medical Officer of Health (Staff Division 1), returnable by 30th September. Canvassing disqualifies.

London County Council.

RADIO-THERAPEUTIST (temporary) required at HAMMERSMITH HOSPITAL and BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.12. Special qualifications in, or long experience of, Radiotherapy and also good surgical experience essential. Person appointed may be required to undertake courses of instruction for post-graduate students at the Postgraduate School on such terms as may be agreed upon between Council and School.

£1000–£50–£1250 a year (no emoluments).

Particulars and form (stamped addressed foolscap envelope necessary) from Medical Officer of Health (Staff Division 1), returnable by 30th September. Canvassing disqualifies.

Westminster Hospital,

St. John's-gardens, S.W.1.

Applications are invited for the office of "WANDER" SCHOLAR (CLINICAL PATHOLOGIST AND REGISTRAR to the CHILDREN'S DEPARTMENT). Salary £250 per annum. Duties to commence 1st October, 1940. Candidates must be registered Medical Practitioners who have held a resident Hospital post and had some experience in pathology or in diseases of children. The office is a whole-time one, is tenable for one year, and is subject to one month's notice on either side.

Applications (three copies), together with three copies of recent testimonials, should be submitted to the undersigned (from whom further details regarding duties of the office can be obtained) not later than 25th September, 1940.

CHARLES M. POWER, Secretary.

The Royal Dental Hospital of London,

32, Leicester-square, W.C.2.

Applications are invited from Dental Surgeons, who also hold Medical qualifications, for the appointment of MEDICAL REGISTRAR to become vacant on the 1st January, 1941. The appointment is for one year with a maximum period of three years (subject to National Service requirements). Salary £500, rising to £600 per annum. Age preferably between 25 and 32. Private Practice not permitted.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than Saturday the 28th September.

W. J. ICKERINGILL, Secretary-Superintendent.

Hospital for Consumption and Diseases

OF THE CHEST, Brompton, S.W.3.

Applications for the post of ASSISTANT RESIDENT MEDICAL OFFICER (B2) are invited from registered Medical Practitioners, Male and Female, including R Practitioners who now hold A posts.

Experience in Artificial Pneumothorax essential, and in Ear, Nose, and Throat work desirable. Salary £150 per annum, with board and residence. The appointment is for six months, commencing on 9th November, 1940.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of one or more recent testimonials, should reach the undersigned not later than Saturday, 21st September, 1940.

F. G. ROUVRAY, Secretary.

Brompton, September, 1940.

Queen Mary's Hospital for the East

END, Stratford, E.15.

Applications are invited from fully qualified and registered Medical Men for the following A posts:—

Post.	*Salary.*
CASUALTY OFFICER No. 1	£150 per annum.
CASUALTY OFFICER No. 2	£130 ,,
HOUSE SURGEON	£150 ,,

The appointments will date from the 1st of October, 1940, and will be for six months.

Candidates, who must be single, should send applications, together with copies of testimonials, to the undersigned not later than Saturday, the 21st of September, 1940.

BERNARD T. HEMPEL, Captain, Chairman.

National Temperance Hospital,

Hampstead-road, N.W.1.

Applications are invited to fill a vacancy for the post of CASUALTY OFFICER who will be required to act as House Surgeon under the E.M.S. (A post). Salary £140 per annum, with board, residence, and laundry. The appointment is for a period of six months as from 23rd September.

Applications, stating qualifications, age, &c., with copies of not more than three testimonials, by the 17th September, addressed to the Secretary.

The Royal Waterloo Hospital,
Waterloo-road, S.E.1.

Applications are invited from registered Medical Practitioners (Male and Female) for the appointment of a CASUALTY OFFICER (B2) to become vacant on 7th October, including R Practitioners within six months of qualification. If held by an R Practitioner appointment will be limited to six months. Otherwise it will be subject to renewal. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than 25th September.

J. H. TEASDALE, Secretary.

His Majesty's Colonial Service.

THE COLONIAL MEDICAL SERVICE.

VACANCIES FOR MEDICAL OFFICERS.

The maintenance of an efficient Colonial Medical Service constitutes a vital part of the national war effort and it is most important that the Service should be assured of an adequate supply of doctors.

The Secretary of State for the Colonies therefore invites applications from doctors possessing a medical qualification registrable in the United Kingdom who are British subjects and who are under thirty-five years of age.

Medical Officers are appointed in the first instance for general service. But there are ample opportunities for work in special branches of medicine and surgery, in public health, and in medical research.

The normal salary scale is from £600 to between £1000 and £1120. There are large numbers of super-scale posts to which promotion is made on merit and which carry higher salaries.

Government quarters, in many cases free of rent, and first-class passages to and from the Colonies are provided, and an adequate pension scheme is in force.

Selected candidates are normally required to attend a course of instruction in Tropical Medicine and Hygiene either before proceeding overseas or during their first period of leave.

Further particulars, including the regulations governing admission to the Colonial Medical Service, may be obtained from the Director of Recruitment (Colonial Service), 29, Queen Anne's-gate, London, S.W.1.

Surrey County Council.
PUBLIC HEALTH DEPARTMENT.
REDHILL COUNTY HOSPITAL (300 + 160 Emergency Beds.)

RESIDENT ASSISTANT MEDICAL OFFICER (B2).

Applications are invited for the above appointment which will be available for a period of six months, renewable for a further six months. ("R" Practitioners who held "A" appointments may apply, but if appointed the term of appointment is limited to six months.) The salary will be at the rate of £250 per annum, together with full residential emoluments valued at £125 per annum. Applicants should preferably have had previous resident hospital experience.

Applications, stating nationality, age, qualifications, and experience, and enclosing copies of not more than three recent testimonials, should be sent to the Medical Superintendent, Redhill County Hospital, Earlswood Common, Redhill, so as to reach him not later than the 21st September, 1940.

DUDLEY AUKLAND, Clerk of the Council.

County Hall, Kingston-upon-Thames, 13th September, 1940.

Salford Royal Hospital.
(256 Beds.)

CASUALTY HOUSE SURGEON AND HOUSE SURGEON.

Applications are invited from registered Medical Practitioners, Men and Women, for the appointment of Casualty House Surgeon and House Surgeon; both A appointments—vacant 1st October. If held by R Practitioner the appointment will be limited to six months, otherwise it will be for a period of nine months. Salary £125 per annum, plus emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned at once.

H. B. SHELSWELL, General Superintendent and Secretary.

Tilbury Hospital, Tilbury, Essex.

The Committee of Management of the Seamen's Hospital Society invite applications from registered Male Medical Practitioners for the appointment of SENIOR RESIDENT HOUSE OFFICER (B2) becoming vacant on the 1st October, including R Practitioners who now hold A posts. If held by an R Practitioner the appointment will be limited to six months. Salary at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, accompanied by copies of recent testimonials, should be sent immediately to the undersigned.

F. A. LYON, Secretary.

Seamen's Hospital Society, Greenwich, S.E.10.

Walsall General Hospital.

The Committee invite applications for the appointment of HONORARY PHYSICIAN. Communication should be made with the undersigned.

WALTER FRANCOMBE, House Governor.

7th September, 1940.

The Children's Hospital,
KING EDWARD VII MEMORIAL, BIRMINGHAM, 16.

HOUSE SURGEON NO. 1. (A)
HOUSE SURGEON NO. 2. (A)

Applications are invited from registered Medical Practitioners, Male and Female, including R Practitioners within three months of qualification, for the above appointments.

The post of House Surgeon No. 1 becoming vacant on 1st November and that of House Surgeon No. 2 on 15th October, both for a period of six months. The salary for each post is at the rate of £75 per annum, with full residential emoluments, but if candidates have held satisfactory appointments at approved hospitals, the salary will be at the rate of £100 per annum.

Applications, stating age and qualifications, with dates and nationality, should be sent to the undersigned not later than 5th October, 1940.

HAROLD F. SHRIMPTON, House Governor.

9th September, 1940.

Royal Surrey County Hospital,
GUILDFORD.

APPOINTMENT OF HOUSE PHYSICIAN (A).

Applications are invited from registered Medical Practitioners (Male), including R practitioners within three months of qualification, for the appointment of House Physician vacant immediately.

The appointment is for six months and is recognised as qualification for the M.D. examination.

Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications, with dates and nationality, accompanied by not more than three testimonials, should be sent to the Secretary-Superintendent not later than 21st September.

Grimsby and District Hospital.

RESIDENT ANÆSTHETIST AND JUNIOR HOUSE SURGEON (A).

Applications are invited from registered Medical Practitioners for the above appointment, including R Practitioners within three months of qualification. If held by an R Practitioner, appointment will be for a period of six months. Salary is £175 per annum.

Applications, stating age, qualifications, with dates and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned.

H. B. COATES, Secretary-Superintendent.

11th September, 1940.

Emergency Hospital (40 Beds), Gosport,
HANTS.

APPOINTMENT OF RESIDENT ANÆSTHETIST (B2).

Applications are invited from registered Medical Practitioners, Male and Female, for the appointment of Resident Anæsthetist (B2), now vacant, including R Practitioners who now hold A posts. If held by an R Practitioner, the appointment will be limited to six months, otherwise it will be for the duration of the war. The salary is at the rate of £350 per annum; one month's notice on either side.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

H. LESLIE CRONK, County Medical Officer.

St. Bartholomew's Hospital, Rochester.
(201 Beds—Five Residents.)

APPOINTMENTS OF HOUSE SURGEON AND CASUALTY OFFICER.

Applications are invited from registered Medical Practitioners, Male, for the appointments of

HOUSE SURGEON (A)
and
CASUALTY OFFICER (A)

to become vacant on 1st October, 1940, including R Practitioners within three months of qualification. If held by R Practitioners the appointments will be for six months. Salary is at the rate of £150 per annum, with full residential emoluments and with an allowance from the Ministry of Health at present at the rate of £100 per annum.

Applications, stating age, qualifications, experience, etc., accompanied by copies of two testimonials or one from the Dean of the Candidates' Medical School, should be received by the Superintendent-Secretary not later than NOON, 20th September, 1940.

9th September, 1940.

Walsall General Hospital.

The Committee invite applications from registered Medical Practitioners (Male), including R Practitioners within three months of qualification, for the post of HOUSE SURGEON, "A" appointment. Duties to include Ear, Nose, and Throat and General Surgery. To commence duty 2nd October, 1940. Salary at the rate of £150 per annum. If held by an R Practitioner the appointment will be for a period of six months.

Applications, accompanied by copies of three recent testimonials, to be sent to the undersigned as early as possible.

WALTER FRANCOMBE, House Governor.

7th September, 1940.

County Borough of St. Helens.

ASSISTANT MEDICAL OFFICER OF HEALTH.

Applications are invited for the post of Assistant Medical Officer of Health (Male).

The duties will be mainly in connexion with the School Medical Service and Maternity and Child Welfare, but frequently include Infectious Diseases, Tuberculosis, and General Sanitary work, so that the post gives considerable general experience.

Candidates should have special experience in the diseases of children and the possession of a Diploma in Public Health is very desirable.

The salary will be at the rate of £500 per annum, plus travelling expenses, rising by annual increments of £25 to a maximum of £700 per annum. For a period expected to be the duration of the war, arrangements could be made for a suitable candidate to live at the Council's Eccleston Hall Sanatorium, in which case the salary would be at the rate of £400 per annum, rising by annual increments of £25 to a maximum of £600 per annum, with the usual hospital emoluments. The salary is at present subject to a temporary war cost of living bonus at the rate of 6 per cent. on the first £300 and 3 per cent. on the next £200 or part.

In the case of a candidate now in the service of another authority on a rising scale, recognition may be given to past service with such authority in fixing the commencing salary.

The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination.

Forms of application may be obtained from the Medical Officer of Health, Town Hall, St. Helens, and completed applications, accompanied by copies of not more than three recent testimonials, should reach him not later than the 21st September, 1940.

Canvassing members of the Council or Committees of the Corporation will be a disqualification.

FRANK HAUXWELL, Medical Officer of Health.

Town Hall, St. Helens, 2nd September, 1940.

Hull Corporation Health Department.

ASSISTANT MEDICAL OFFICER OF HEALTH (FEMALE).

Applications are invited from duly qualified Medical Women, under the age of forty years and of not less than three years' standing in their profession, for the post of Assistant Medical Officer of Health.

Salary £600 per annum, rising, subject to satisfactory service, by annual increments of £25 to £700.

The duties consist mainly of work in the Maternity and Child Welfare Department, the School Medical Service, and the Tuberculosis Department.

Candidates must have had special experience in Obstetrics, Paediatrics, and Venereal Diseases, and preference will be given to those possessing the Diploma in Public Health or similar qualification.

Application forms may be obtained from the Medical Officer of Health, Guildhall, Hull, to whom they should be returned not later than 10 A.M. on Monday, the 23rd September, 1940.

New Sussex Hospital for Women,

Windlesham-road, BRIGHTON.

(60 Beds.)

Applications are invited from fully qualified Medical Women for the post of HOUSE PHYSICIAN for a period of six months. Salary at the rate of £100 per annum. Duties to commence on the 27th November.

Applications, together with copies of recent testimonials, to be sent to the Secretary, New Sussex Hospital, Windlesham-road, Brighton, on or before the 18th September.

City and Port of Plymouth.

ASSISTANT MEDICAL OFFICER OF HEALTH.

Applications are invited from duly qualified Medical Men for the post of Assistant Medical Officer of Health to the City and Port of Plymouth.

Applicants should not be more than thirty-five years of age, and must possess a Diploma in Public Health, or a qualification in State Medicine, or a Diploma in Tropical Medicine.

The person appointed will be required to act as Boarding Medical Officer at the Port and he will also assist in the General Public Health work of the City. Preference will be given to applicants having experience in Tuberculosis and Venereal Diseases. The successful applicant will be required to act under the general supervision of the Medical Officer of Health, and to carry out any duties delegated to him from time to time.

The salary will be at the rate of £500 per annum, rising by annual increments of £25 to £700 per annum.

The appointment is whole time, and the person appointed will be required to refund to the Council any fees received by him in respect of any work, where such work is undertaken by virtue of his office or is in consequence of his being a medical officer of the Corporation.

The post will be subject to the provisions of the Local Government Superannuation Act, and will be terminable by two months' notice on either side.

The person appointed will be required to pass a medical examination.

Forms of application may be obtained from the undersigned and should be returned, together with copies of not more than three recent testimonials, on or before 21st September. Envelopes must be endorsed "Assistant Medical Officer of Health."

T. PEIRSON,

Medical Officer of Health, City and Port of Plymouth.

Town Hall, Stonehouse, Plymouth.

City of Plymouth.

CITY GENERAL HOSPITAL. (635 Beds.)

Applications are invited from duly qualified and registered Medical Practitioners (Male and Female), including R Practitioners within three months of qualifying, for the appointment of JUNIOR ASSISTANT MEDICAL OFFICER (A).

The appointment will be for a period of six months and will be terminable by one month's notice on either side.

The duties of the post will be chiefly on the medical side of the Hospital.

Salary at the rate of £250 per annum, with full residential emoluments. All fees received by the officer must be refunded to the Council.

Further details may be obtained from the Medical Superintendent.

Forms of application may be obtained from the undersigned, and should be forwarded, together with copies of not more than three recent testimonials, not later than 21st September.

T. PEIRSON, Medical Officer of Health.

Town Hall, Stonehouse, Plymouth.

Coventry and Warwickshire Hospital.

(452 Beds.)

APPOINTMENT OF RESIDENT SURGICAL OFFICER (B1)

Applications are invited from registered Medical Practitioners for the appointment of Resident Surgical Officer. Applicants must have held house appointments and have had previous surgical experience. Preference will be given to candidates holding the Diploma of F.R.C.S., and suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply. Salary at the rate of £350 per annum, with full residential emoluments. The appointment is for twelve months in the first instance, and is renewable.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be addressed to the undersigned immediately.

S. CECIL HILL, House Governor and Secretary.

Coventry and Warwickshire Hospital.

(452 Beds.)

FRACTURE AND ORTHOPÆDIC SERVICES.

Applications are invited for the post of RESIDENT REGISTRAR to the FRACTURE AND ORTHOPÆDIC DEPARTMENT (B1). Salary at the rate of £350 per annum, with full residential emoluments.

Candidates should hold the M.S. Degree of a university of the United Kingdom, or hold the Diploma of F.R.C.S., and must have had experience in modern methods of the treatment of fracture cases. Suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply. The appointment is for twelve months in the first instance, and is renewable.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than Tuesday, September 17th.

S. CECIL HILL, House Governor and Secretary.

City of Salford.

PUBLIC HEALTH DEPARTMENT.

ASSISTANT RESIDENT OBSTETRIC OFFICER (B1).

Applications are invited from registered Medical Practitioners (unmarried) for the appointment of Assistant Resident Obstetric Officer at HOPE HOSPITAL, Salford, the appointment to become vacant about the middle of October, 1940.

Applicants should have held house appointments and had recent obstetric experience. Preference will be given to candidates holding one of the diplomas of the R.C.O.G. Suitable qualified R Practitioners holding B2 or B1 appointments are invited to apply. Salary is at the rate of £350 per annum, with full residential emoluments, and the appointment will be for one year.

Form of application and particulars of appointment may be obtained by sending a stamped addressed foolscap envelope to the Medical Officer of Health, 143, Regent-road, Salford, 5, to whom applications must be returned, accompanied by copies of not more than three recent testimonials, not later than 21st September, 1940.

H. H. TOMSON, Town Clerk.

Birmingham United Hospital.

(THE GENERAL HOSPITAL, THE QUEEN'S HOSPITAL, THE QUEEN ELIZABETH HOSPITAL.)

THE QUEEN ELIZABETH HOSPITAL.

APPOINTMENT OF TWO RESIDENT SURGICAL REGISTRARS (B1).

There will be, on October 1st, vacancies at the Queen Elizabeth Hospital for two Resident Surgical Registrars. Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding the diploma of F.R.C.S. Suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply. Salary at the rate of £100 per annum, with full residential emoluments.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than September 27th.

G. HURFORD, Secretary.

North Staffordshire Royal Infirmary,
STOKE-ON-TRENT.
(Normally 412 Beds. Class 1A.)

Applications are invited from registered Medical Practitioners, Male and Female, for the following appointments vacant 30th September :—
Three HOUSE SURGEONS (A).
One HOUSE PHYSICIAN (A).
One HOUSE SURGEON, E.N.T. DEPARTMENT (A).
One RESIDENT ANÆSTHETIST (A).
Appointment will be for a period of six months. Salary at the rate of £150 per annum, with full residential emoluments.
Applications, stating age, qualifications with dates, and nationality, accompanied by three copy testimonials, should be sent to the Secretary and House Governor as soon as possible.

Borough of Gravesend.

APPOINTMENT OF MEDICAL OFFICER OF HEALTH.
Applications are invited from duly qualified persons for the appointment of Medical Officer of Health of the Borough of Gravesend, at an inclusive commencing salary of £800 per annum, rising, subject to satisfactory service, by annual increments of £100 to a maximum of £1100.
Candidates must possess the qualifications prescribed by Section 108 (3) of the Local Government Act, 1933. The person appointed will be required to devote his whole time to the service of the Corporation and will not be permitted to engage in private practice.
In addition to performing the duties from time to time prescribed by the Ministry of Health, the person appointed will act as General Medical Superintendent of the Isolation Hospital and will have under his care the Maternity and Child Welfare Clinics. He will also be appointed School Medical Officer. (There is a full-time Assistant School Medical Officer.)
The appointment will be subject to the provisions of Section 110 of the Local Government Act, 1933, Part III, of the Sanitary Officers (Outside London) Regulations, 1935, the Local Government Superannuation Act, 1937, and to the Council's Staff Regulations. The successful candidate will be required to pass a medical examination.
Applications, upon a form which will be supplied by me upon receipt of a stamped addressed envelope, accompanied by copies of not more than three recent testimonials, must be forwarded in an envelope endorsed "Medical Officer of Health," to reach me not later than Monday, the 30th day of September, 1940.
Canvassing members of the Town Council, or their officials, either directly or indirectly, will be a disqualification.
H. H. BROWN, Town Clerk.
Town Clerk's Office, 4, Woodville-terrace, Gravesend,
3rd September, 1940.

Christie Hospital and Holt Radium
INSTITUTE, WITHINGTON, MANCHESTER, 20.

JUNIOR RESIDENT SURGICAL OFFICER
(B2 Appointment).
Applications are invited from registered Medical Practitioners, Male or Female, including R Practitioners who now hold A posts, for the appointment of Junior Resident Surgical Officer, to become vacant on 1st October, 1940. If held by an R Practitioner appointment will be limited to six months, otherwise it may be renewable. Previous resident appointment desirable. Salary at the rate of £150 per annum, plus residence, board, and laundry.
Applications, stating age and nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than the 21st September, 1940.
PERCY N. GLASS, Superintendent and Secretary.

Birmingham and Midland Eye Hospital,
Church-street, BIRMINGHAM, 3.

Applications are invited for the post of SURGICAL REGISTRAR (B1) to the Hospital.
Candidates must have had not less than two years' experience in Ophthalmic work, and should have held a resident post in an Ophthalmic Hospital for at least one year. Suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply.
Appointment will be for one year, with eligibility for reappointment.
Salary at the rate of £250 per annum, which includes payment for attendances at the Branch Hospital. Particulars of duties, &c., may be obtained on application.
Applications, together with copies of testimonials, to be sent immediately, addressed to the undersigned.
F. M. HAUGHTON, House Governor.

Royal Albert Edward Infirmary and
DISPENSARY, WIGAN. (189 Beds.)

APPOINTMENT OF A HOUSE SURGEON (A).
Applications are invited from registered Medical Practitioners (Male), for the appointment of a House Surgeon (A) to become vacant on 30th September. If held by an R Practitioner, appointment will be limited to six months. Salary is at the rate of £150 per annum, with full residential emoluments.
Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned without delay.
A. STANLEY BRUNT,
General Superintendent and Secretary.
26th August, 1940.

General Hospital, Nottingham.
(389 Beds.)

Applications are invited from registered Medical Practitioners (Male and Female) for the appointment of a HOUSE PHYSICIAN (A) for the above Hospital—duties to commence on October 14th, 1940. The appointment is for six months. Salary at the rare of £200 per annum, with full residential emoluments.
Applications, stating age, qualifications with dates, and nationality, and copies of testimonials, should be sent to the undersigned.
HENRY M. STANLEY, House Governor and Secretary.

Dewsbury and District General
INFIRMARY, DEWSBURY. (100 Beds.)

Applications are invited for the post of SECOND HOUSE SURGEON (A) (Male) now vacant, including R Practitioners within three months of qualification. If held by an R Practitioner, appointment will be for a period of six months. Salary £150 per annum, with emoluments. The duties are principally those of a House Physician and Casualty Officer.
The Infirmary is a modern Voluntary Hospital and has the usual Special Departments, with Visiting Consulting Specialists in attendance.
Applications, stating age, qualifications with dates, and nationality, together with copies of recent testimonials, to be addressed to the undersigned without delay.
FRED SMITH, Secretary-Superintendent.

Derbyshire Royal Infirmary, Derby.
GENERAL HOSPITAL. (416 Beds.)
(Recognised under F.R.C.S. Regulations.)

Applications are invited for the post of OPHTHALMIC HOUSE SURGEON (non-resident), Male or Female, A appointment. If held by an R Practitioner the appointment will be limited to six months. Candidates must be qualified and registered under the Medical Acts and unmarried. Salary will be £300 per annum.
Applications, with copies of testimonials and particulars of experience, to be sent to the undersigned.
ARTHUR TAYLOR, Superintendent and Secretary.
27th August, 1940.

The Derbyshire Hospital for Women,
FRIAR GATE, DERBY.
(60 Beds—12 Cots.)

Applications are invited from registered Medical Practitioners, Male and Female, for the appointment of RESIDENT HOUSE SURGEON (B2), to become vacant on the 6th October, 1940. If held by R Practitioner the appointment will be limited to six months. Previous Obstetrical experience desirable. The Hospital affords experience in gynæcology and obstetrics. Salary at rate of £180 per annum, with full residential emoluments.
Applications, stating age, qualifications, and experience, accompanied by testimonials, should be sent to the undersigned now.
F. T. WILTON, Superintendent and Secretary.

District Infirmary, Ashton-under-Lyne.
(200 Beds, mainly surgical.)

APPOINTMENT OF A HOUSE SURGEON (A).
Applications are invited from registered Medical Practitioners, Male and Female, for the appointment of a House Surgeon (A) to become vacant immediately. If held by an R Practitioner, appointment will be limited to six months. Salary is at the rate of £150 per annum, with full residential emoluments.
Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.
FRANK OLIVER, General Superintendent and Secretary.

Elizabeth Garrett Anderson Hospital
AND
OSTER HOUSE, ST. ALBANS.

Applications are invited from fully qualified Medical Women for the following posts: One HOUSE SURGEON for E.G.A. Hospital and Two HOUSE SURGEONS for Oster House, for a period of six months, duties to commence 1st November.
Salaries will be pooled under the Emergency Medical Services Scheme and allocated according to experience, with a minimum of £100 per annum.
Applications, with copies of three testimonials, should be sent to the Secretary, E.G.A. Hospital, Euston-road, N.W.1, by 30th September.

The Children's Hospital, Sheffield.
(157 Beds.)

Applications are invited from registered Medical Practitioners, Male and Female, for the appointment of a HOUSE PHYSICIAN (A) to become vacant on 24th October, 1940, including R Practitioners within three months of qualification. Appointment is for a period of six months. Salary at the rate of £100 per annum, with full residential emoluments.
Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned.
T. H. G. GARTLAND, Superintendent and Secretary.

Coldeast Emergency Hospital,
SARISBURY GREEN, Nr. SOUTHAMPTON.

APPOINTMENT OF A HOUSE SURGEON.

Applications are invited from registered Medical Practitioners, Male and Female, for the appointment of a House Surgeon (A) to become vacant on 30th September, 1940, including R Practitioners within six months of qualification. If held by an R Practitioner, appointment will be limited to six months. Salary is at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than 23rd September, 1940.

A. WILSON, Medical Superintendent.

Sutton and Cheam Hospital, Sutton, SURREY.
(75 Beds normal. Plus 75 emergency.)

APPOINTMENT OF JUNIOR RESIDENT MEDICAL OFFICER. (B2).

Applications are invited from Male registered Medical Practitioners for the appointment of Junior Resident Medical Officer, to become vacant on October 1st, 1940, including R Practitioners within six months of qualification. If held by an R Practitioner the appointment will be limited to six months.

Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with date, and nationality, and accompanied by copies of three recent testimonials, should be sent to the Secretary not later than Thursday, September 19th, 1940.

Bedford County Hospital.

Applications are invited from registered Medical Practitioners, Male and Female, for the appointment of a 2nd HOUSE SURGEON (A) to become vacant on October 1st, including R Practitioners within six months of qualification. Appointment for a period of six months. Salary £150 per annum, with full residential emoluments. Application, stating age, qualifications, with dates and nationality, together with three recent testimonials, to be sent to the Secretary, Hon. Medical Staff Committee, as soon as possible.

Royal Sussex County Hospital,
BRIGHTON.
(380 Beds.)

APPOINTMENT OF A CASUALTY HOUSE SURGEON (A).

Applications are invited from registered Medical Practitioners (Male) for the appointment of a Casualty House Surgeon (A) to become vacant on 5th October, 1940, including R Practitioners within three months of qualification. If held by an R Practitioner, appointment will be for a period of six months. Otherwise it will be for a period of at least six months. Salary is at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent as soon as possible to the undersigned.

L. L. W. LANCASTER-GAYE, Secretary-Superintendent.

Doncaster Royal Infirmary.

Applications are invited from registered Medical Practitioners (Male) for the appointment of ORTHOPÆDIC HOUSE SURGEON (B2), including R Practitioners who now hold A posts. If held by an R Practitioner the appointment will be limited to six months.

The salary is at the rate of £175 per annum, with usual emoluments.

Applications, together with copies of two recent testimonials, should be forwarded to the undersigned immediately.

R. LANCASTER, Secretary-Superintendent.

Cornwall Works Dispensary,
SMETHWICK.

APPOINTMENT OF MEDICAL OFFICER.

The Board of Management require the services of a properly qualified Medical Officer to devote the whole of his time to the members of the Dispensary.

The salary will be £600 per annum, payable monthly with extras.

Applications, with full particulars of qualifications, age, and copies of testimonials, must be addressed as soon as possible to Secretary, Cornwall Works Dispensary, Smethwick.

City of Portsmouth.
SAINT MARY'S HOSPITAL. (1275 Beds.)

Applications are invited for the immediate appointment of One SENIOR ASSISTANT RESIDENT MEDICAL OFFICER (B1 post). Applicants should have had at least two years' hospital experience, and preference will be given to those having a knowledge of, and experience in, general medical work. Suitable qualified R Practitioners holding B1 or B2 appointments may apply. Salary at the rate of £350 per annum for the first year, and £375 per annum for the second year, with residential emoluments valued at £125 per annum. The above appointment is subject to the provisions of the Local Government Superannuation Act, 1937.

Application forms may be obtained from, and must be returned to, the Acting Medical Officer of Health, Northern Secondary School, Portsmouth, not later than Monday, 23rd September, 1940.

Canvassing will be a disqualification.

F. J. SPARKS, Town Clerk.

The Guildhall, Portsmouth, 2nd September, 1940.

Appointment of Works Medical Officer
to large group of Engineering Factories in the MIDLANDS.

Applications are invited for the services of a whole-time Medical Officer. Preference will be given to applicants who have had experience in a large general hospital in an industrial district, who hold the D.P.H., and are between thirty-five and fifty years of age. A minimum salary of £650 per annum will be paid.—Address, No. 732, THE LANCET Office, 7, Adam-street, Adelphi, W.C.2.

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Practice, County Durham. Salary £450 per annum, plus £50 for use of car, furnished house, and garage.—Apply, R. SUMNER & Co., 40, Hanover-street, Liverpool, 1.

Full-time Medical Officer required by
Engineering Firm in Coventry employing 5000 people. Salary £650 per annum. Applications to Address, No. 731. THE LANCET Office, 7, Adam-street, Adelphi, W.C.2.

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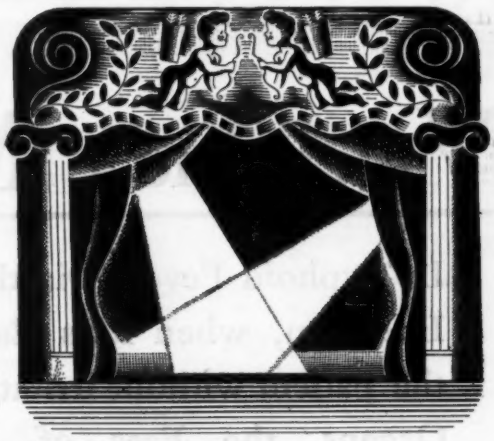

'enter a doctor'

(MACBETH, ACT IV, SCENE III)

What is "a doctor"? Can the different personalities, interests and opinions which go to make the medical profession be harmonised and represented by a type? Lacking the courage of Shakespeare we leave our stage empty. We do, however, believe that the following statements are true of any doctor engaged in general practice:—

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